DPM/DPM-PLUS System Generation and Management Guide

Order No. AA-J531C-TC

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SOFTWARE VERSION:	**DPM V4.1** **DPM-PLUS V1.1**

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PREFACE

DPM/DPM-PLUS DOCUMENTATION SET

The DPM/DPM-PLUS documentation set consists of three manuals. These manuals describe how to generate, program, and operate a DPM/DPM-PLUS system. The three manuals are:

- *DPM/DPM-PLUS System Generation and Management Guide*, AA-J531C-TC

  This manual is intended for personnel responsible for the generation and overall operation of a DPM/DPM-PLUS system. The manual describes how to generate a DPM/DPM-PLUS system, how to get the system running, how to use utilities to check the system, how to shut down the system, and how to interpret system errors.

- *DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide*, AA-J529B-TC

  This manual is intended for application programmers who write host and remote application tasks. The manual describes how to program and operate a DPM50 or DPM23, two DECdataway Intelligent Subsystems (DIS). It explains how a DIS communicates with a DPM host over the DECdataway.

- *DPM/DPM-PLUS Terminal User's Guide*, AA-J530B-TC

  This manual is intended for application programmers. It describes how to write DPM host application programs that can communicate with terminals over the DECdataway, and how to run host application tasks from DECdataway terminals.

MANUAL ORGANIZATION

This manual has four parts:

Part I introduces DPM/DPM-PLUS concepts.

Part II explains how to generate a DPM/DPM-PLUS system.

Part III describes how to get the system running–verifying the generation, setting up system files, and starting the system.

Part IV describes how to manage a running DPM/DPM-PLUS system, interpret errors, and shut down the system.

RELATED DOCUMENTS

In order to use DPM/DPM-PLUS, you must be thoroughly familiar with the operating system. Please refer to the *RSX-11M/RSX-11S Documentation Directory* (AA-2593E-TC) and to the *RSX-11M-PLUS Documentation* [illegible]*ory* (AA-H426A-TC).

The following manuals describe the DPM/DPM-PLUS hardware:

DPM01 DECdataway Terminal Multiplexer User's Guide,
EK-DPM01-UG-002

DPM50 User's Guide, EK-DPM50-UG-002

DPM Terminals Application Programmer's Manual, AA-C878B-TC

IP11/IP300/DPM50 Application Programmer's Manual, AA-C877B-TC

DPM01 DECdataway Terminal Multiplexer Technical Manual,
EK-DPM01-TM-001

DPM50 Technical Description, EK-DPM50-TD-001

DECdataway User's Guide, EK-ISB11-UG-PRE

DECdataway Technical Manual, EK-ISB11-TM-001

Remote Terminals RT801, RT803, RT805 User's Guide,
EK-RT80X-UG-001

Remote Terminals RT801, RT803, RT805 Technical Description,
EK-RT80X-TM-001

CONVENTIONS USED IN THIS MANUAL

In command examples and messages, upper-case characters always appear literally as shown; lower-case characters represent variable information.

In dialogue examples, user input is shown in red.

All commands are terminated by pressing RETURN, which is not shown explicitly in this manual.

Shaded text applies only to DPM-PLUS.

Optional parameters in the FORTRAN subroutine calls and MACRO-11 requests are preceded by commas and within square brackets. If all optional parameters for a call or request are omitted, no comma after the required portions is necessary. However, if an optional parameter is specified, and other optional parameters have been omitted to its left, commas must be used to show the empty fields.

PART I
INTRODUCTION

CHAPTER 1
INTRODUCTION TO DPM AND DPM-PLUS

A Distributed Plant Management (DPM) system is a network of computers and terminals. The DPM host computer is a PDP-11/34, 11/44, or 11/70. The host operating system may be either RSX-11M (DPM) or RSX-11M-PLUS (DPM-PLUS). This manual uses DPM as a general term when it is not important to distinguish between the two systems.

The communication system which links the DPM host with terminals and remote computer subsystems is called the DECdataway. All DECdataway systems share the following two components:

- A cable, which can be as long as 15,000 feet
- An intelligent DECdataway controller for the host (ISB11)

The following are optional components that may be used with the DECdataway:

- An optical DECdataway link
- A DECdataway interface in a remote subsystem (ISV11)
- DECdataway terminals (RT801, RT803, RT805)
- DECdataway multiplexers (DPM01 and VT110)
- A single-terminal interface (DYT01)

1.1 DECdataway CONTROLLER

The DECdataway controller (ISB-11) is a front-end communications processor which connects to the UNIBUS of the DPM host processor. Each controller supervises the operation of one DECdataway, using a data transfer rate of 56,000 bits per second. A DPM host may have a maximum of four DECdataways.

DECdataway communication is half-duplex and message-oriented. The controller uses an efficient bit-stuffing protocol with 16-bit cyclic redundancy checks for detecting errors. A sequence bit is also generated and checked for each message. When it detects an error, the DECdataway controller automatically retransmits the message.

The DECdataway cable is a multi-drop serial bus. The DECdataway controller functions as a master with respect to slaved devices on its DECdataway. The controller performs two-level priority polling: (1) devices performing data transfers have the higher priority, (2) off-line and inactive devices have lower priority. The DECdataway controller automatically monitors the on-line/off-line status of devices, and reports state transitions to the DECdataway controller driver.

The DECdataway controller provides a direct memory access (DMA) interface for each device. This interface allows data transfers directly to and from user task buffers, incurring minimum system overhead.

Devices are connected in parallel to the DECdataway via 16-pin DECdataway plugs with address jumpers. Each of the plugs (63 maximum per DECdataway) is wired for a different address. Thus, if a device is moved from one plug to another, it will respond only to data communications directed to its new plug address.

1.2 DECdataway DEVICES

Terminals and DECdataway Intelligent Subsystems (DIS) are the two classes of DECdataway devices.

The RT80x class of Factory Data Management (FDM) terminals includes the RT801 Time and Attendance Station, RT803 Basic Work Station, and RT805 Area Work Station. Each of these terminals includes a DECdataway interface. The DPM01 multiplexer has a DECdataway interface, and can connect four conventional CRT or printer terminals to the DECdataway. The VT110 terminal/multiplexer combines a VT100 terminal and DPM01 multiplexer.

There are two DIS configurations:

1. DPM50 DECdataway I/O Subsystem

2. DPM23 Programmable DECdataway Subsystem

Both run the RSX-11S operating system. A DPM50 has either an LSI-11/03 or an LSI-11/23 processor; it always contains an Input/Output Control Processor (IOCM) for process control I/O. A DPM23 has an LSI-11/23 processor. An IOCM is optional for DPM23. Because of a different physical mounting, the DPM23 can have more peripheral options.

DPM software falls into three categories:

1. Terminal software allows host application programs to perform I/O with DECdataway terminals, and dispatches programs in response to operator input.

2. Network software allows application programs in the host and application programs in remote DIS systems to establish logical connections and exchange data.

3. Host DECdataway software manages the communications system for both terminal and network software.

Part II of this manual explains how to generate the DPM software.

1.3 HOST DECdataway SOFTWARE

Terminal software and network software perform all DECdataway I/O through calls to SBDRV, the DECdataway controller driver. SBDRV provides a standard RSX-11 DMA interface between host tasks and DECdataway devices. It processes concurrent read and write requests for each device, treating each device as a separate unit.

Other DECdataway support tasks are:

• ISBINI	DECdataway controller initializer. At system start up, ISBINI loads each controller with microcode and starts it. The two microcode files are a diagnostic confidence check (SBCNCK) and the controller's operational code (ISB11).
• ISBERR	DECdataway error logger. ISBERR records DECdataway errors and events in the log file ISBERR.LOG, on request from SBDRV.
• ISBRPT	DECdataway error reporting task. The operator runs ISBRPT to print an error report from ISBERR.LOG. Chapter 10 describes how to use ISBRPT.
• Utilities	SPY is an operator utility that displays information about devices on the DECdataway. CBC is a utility that allows the operator to change DECdataway address assignments. Chapter 9 describes the utilities. Chapter 2 describes DECdataway addressing.

Figure 1-1 summarizes DPM host DECdataway software.

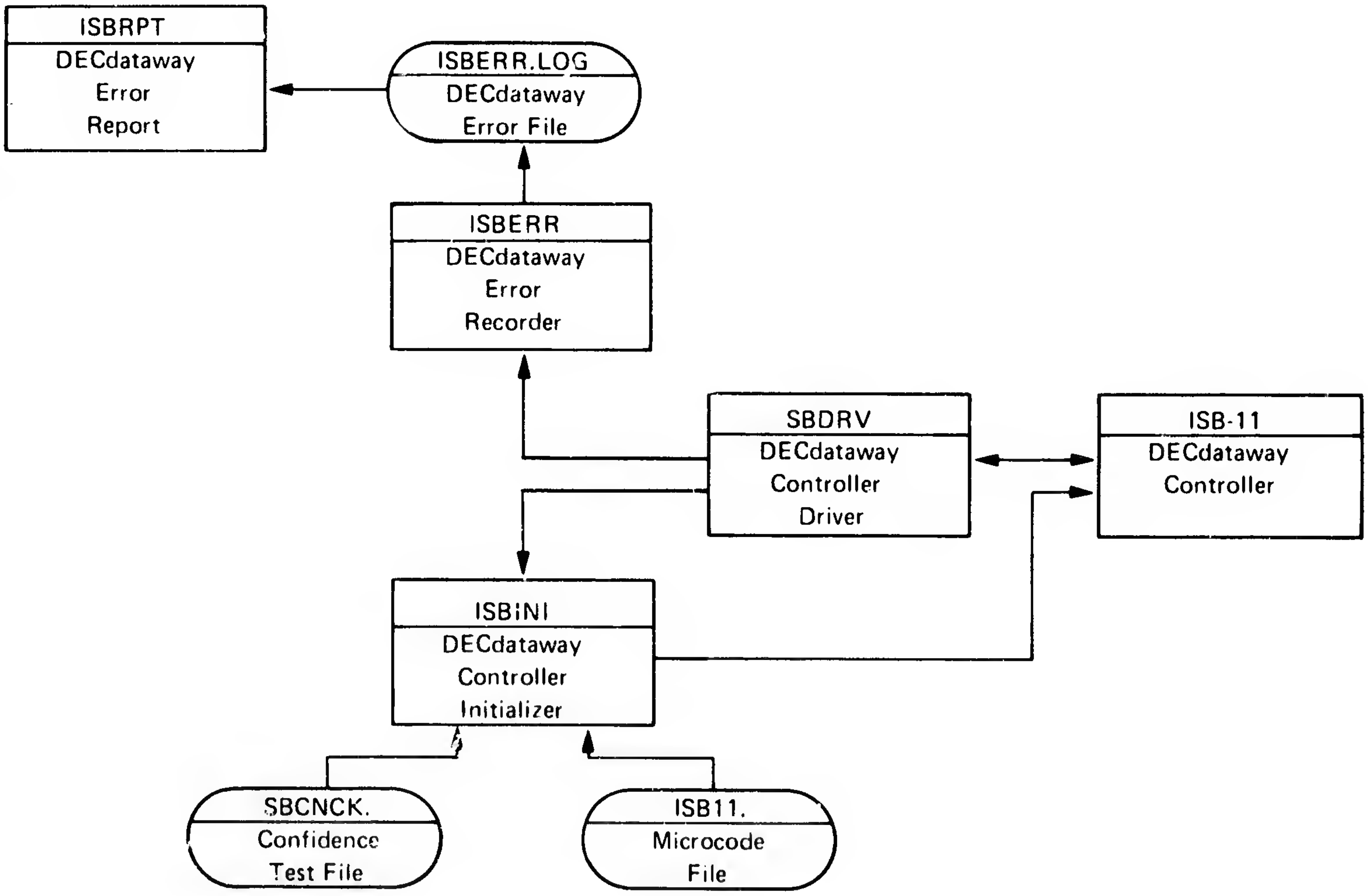


Figure 1-1 DPM/DPM-PLUS Host DECdataway Software

1.4 NETWORK SOFTWARE

DPM network software allows tasks in the host to communicate with tasks in DIS remotes, also called nodes. Each DIS may utilize up to 32 logical connections for data exchange with host tasks.

Network tasks may be written in MACRO-11, FORTRAN-IV, or FORTRAN-77. The network programming requests available to both host and remote tasks are:

Connect

Transmit

Receive

Disconnect

Network requests result in a QIO to a logical unit assigned to the network pseudo-device NI:. The operating system passes these requests to the network stub driver, named NIDRV in both host and remote.

NIDRV passes the request to an ancillary control processor (ACP), similar to the way disk I/O requests are passed to the FILES-11 ACP. The network ACP is named DPM50H in the host and DPM50R in the remote.

The network ACP issues I/O requests to the DECdataway controller driver (SBDRV) in the host or to the DECdataway interface driver (SVDRV) in the remote in order to perform the network functions.

DPM network support tasks include:

• DLC	The downline load and control task. DLC runs in the host and loads a system image into a remote DIS. DLC can initiate communication between the host and remote network ACPs (termed "opening the host/remote communication channel"). DLC can also close the communication channel.
• ULD	The upline dump task, which runs in the host. ULD transfers a remote system image to a host file for later processing by the RSX-11M crash dump analyzer.
• DISBOO	The automatic reboot task, which runs in the host. The host network ACP invokes DISBOO when a communication channel is interrupted. DISBOO can invoke DLC to reboot the remote.
• Utilities	NISTAT and SPY display network status.
• ISVERR	Remote task ISVERR logs DIS DECdataway errors to the DIS console.

DPM network programming is explained in the *DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide*. Figure 1-2 summarizes DPM/DPM-PLUS network software.

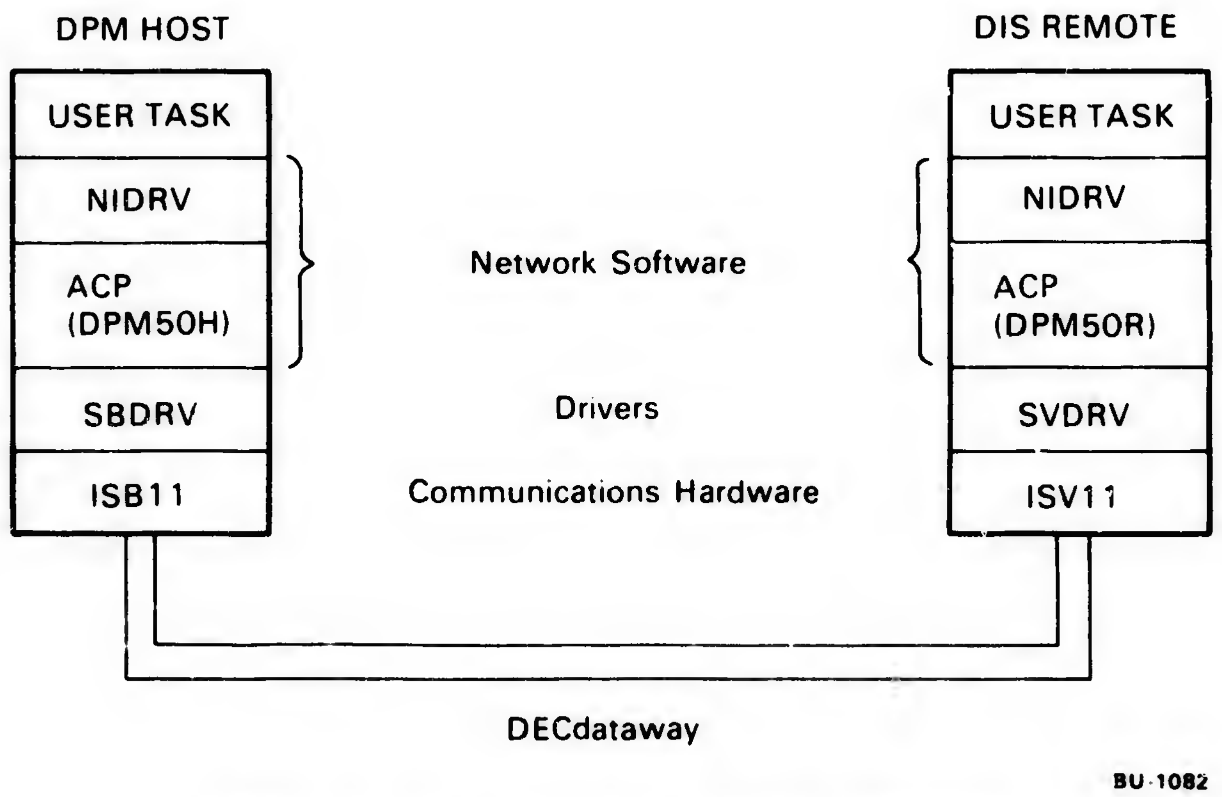


Figure 1-2 DPM/DPM-PLUS Network Components

1.5 TERMINAL SOFTWARE

There are two programming interfaces for DECdataway terminal I/O:

1. The FDM programming interface allows user programs to communicate with RT80x, DPM01, VT110, or DYT01 terminals. It is available under both DPM and DPM-PLUS.
2. **The ATS support allows user programs to communicate with DPM01, VT110, or DYT01 terminals as if they were local terminals. Also, user programs need not be linked with special subroutines. The ATS support is available only under DPM-PLUS. It does not support RT80x terminals.**

There are two dispatchers, which permit users to invoke tasks from DECdataway terminals:

1. The FDM Dispatcher allows an operator to run user-written tasks from both RT80x and DPM01, VT110, or DYT01 terminals. It is available under both DPM and DPM-PLUS.
2. **The ATS Dispatcher allows an operator to run both standard system software and user-written tasks from DPM01, VT110, or DYT01 terminals. It is available only under DPM-PLUS, and does not support RT80x terminals. With the ATS Dispatcher, the system manager can control access to both the system and individual tasks.**

1.5.1 FDM Software

Factory Data Management (FDM) software provides a set of utility routines, support tasks, and a dispatcher package which simplify data collection and management with FDM terminals. Figure 1-3 summarizes FDM terminal software.

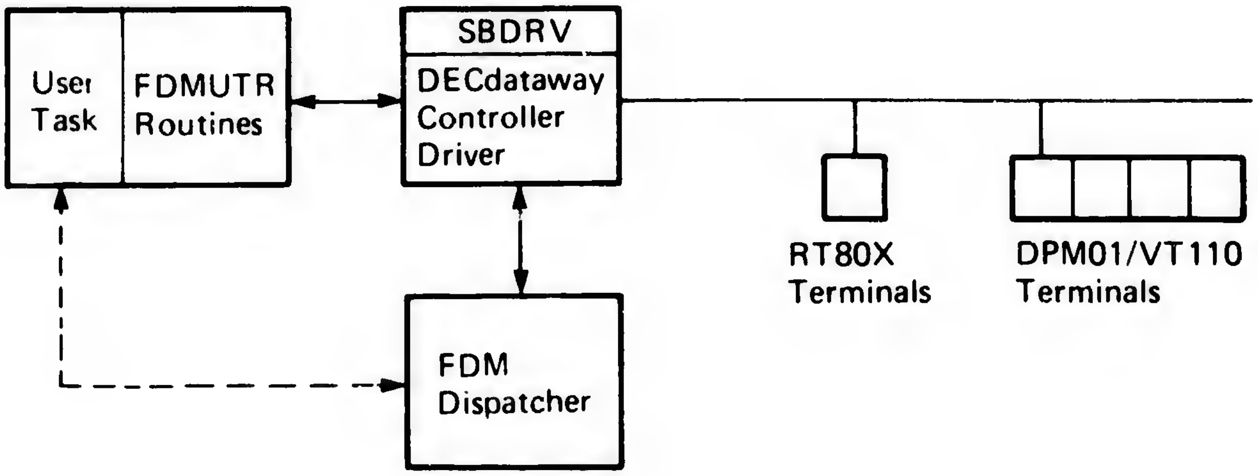


Figure 1-3 FDM Terminal Software

FDM utility software consists of terminal I/O routines, which are interfaced through the CALL facility. User tasks for communicating with DECdataway terminals using the FDM utilities may be written in MACRO-11, FORTRAN IV/IAS-RSX, FORTRAN-77, COBOL-11, or BASIC-PLUS-2.

FDM support software includes tasks whose functions are:

- Time announcement
- Initialization of each port of a DPM01, VT110, or DYT01 with user-specified attributes
- On-line demonstration and testing

The FDM Dispatcher Package is a set of tasks which monitor inactive FDM terminals until an operator initiates a transaction. The dispatcher invokes a specified task and passes control of the FDM terminal to the task. The FDD utility for starting the FDM Dispatcher is described in Chapter 9. As described in Chapter 6, you must set up a Dispatch file for the FDM Dispatcher.

1.5.2 ATS Software

Application Terminal Support (ATS) software is available only under DPM-PLUS. Figure 1-4 summarizes ATS terminal software. ATS software includes a terminal ACP, which provides access from user programs to application terminals connected to the DECdataway through a DPM01, VT110, or DYT01. Tasks written in COBOL-11, BASIC-PLUS-2, FORTRAN-IV, FORTRAN-77, and MACRO-11 can access terminals connected to a multiplexer or DYT01 using standard programming interfaces equivalent to those provided by the RSX-11M-PLUS Terminal Driver. For example, a FORTRAN task may issue a READ and WRITE to a DPM01, VT110, or DYT01 terminal; a MACRO task may issue a QIO.

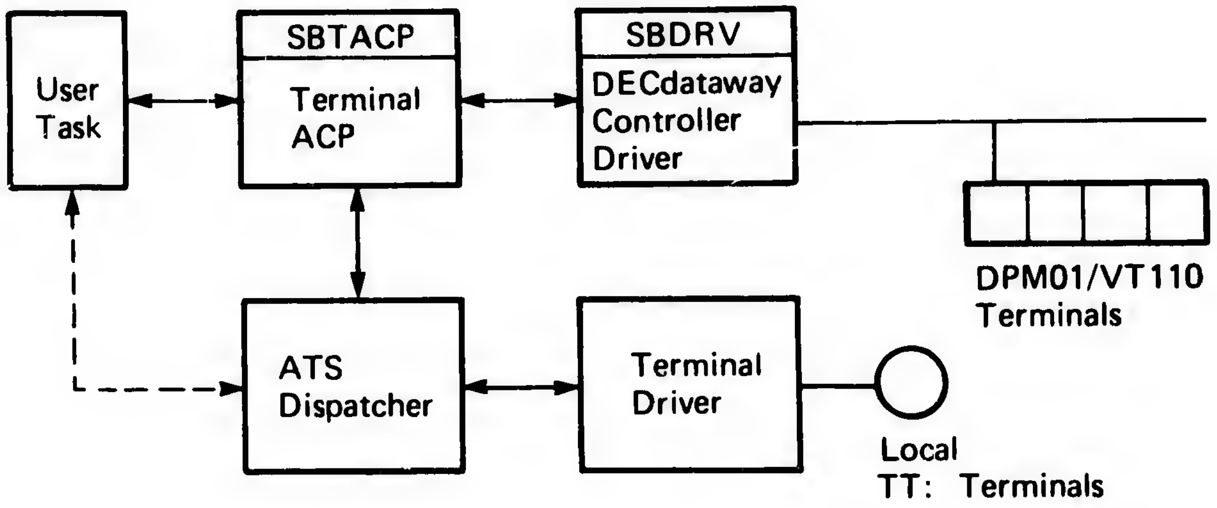


Figure 1-4 ATS Terminal Software

ATS software includes an ATS Dispatcher, which provides the following capabilities:

- Ability to run standard programs from DECdataway terminals
- Controlled access to tasks based on user id, password, and (optionally) terminal used
- Task checkpointing
- Multiple copies of a task in memory

When a DECdataway terminal is connected to the dispatcher, the terminal becomes associated with particular users and tasks. The dispatcher then monitors a connected terminal and allows its users to initiate host tasks from the terminal. The CDU utility for connecting a[illegible]isconnecting specific DECdataway terminals is described in Chapter 9. Chapter 6 describes the files you must set up for the ATS terminal software.

Terminal programming is described in the *DPM/DPM-PLUS Terminal User's Guide*.

CHAPTER 2
DECdataway ADDRESSING

2.1 DECdataway PORTS

The DECdataway is the medium for all DPM communications. A DPM host computer may have two or four DECdataways; each DECdataway has its own controller on the host.

Each DECdataway controller can have a maximum of 64 (decimal) addressable drops, or ports. Port 0 of each controller is called the broadcast channel, and may be used only by the DPM system software. The remaining 63 ports correspond to physical plug connections. Jumper wires within each connector define the port number, 1-77 (octal). DECdataway devices occupy ports as follows:

- Factory Data Management (FDM) RT80x terminals each occupy a single DECdataway port.
- DPM01 or VT110 terminal multiplexers each occupy four consecutive DECdataway ports. Refer to a multiplexer by the first of these ports, which is called the base port.
- The DYT01 terminal interface occupies one port.
- DIS subsystems (DPM50 or DPM23) each occupy two consecutive DECdataway ports. You refer to a DIS subsystem by the first port, which is called the base port.

2.2 DECdataway ADDRESSES

The host's RSX-11M or RSX-11M-PLUS operating system treats each DECdataway port as a separate device, or unit, on a controller named SB. For example, the address of the broadcast channel on the first DECdataway is unit SB0:; if the next three devices are VT110s, their base port DECdataway addresses are SB1:, SB5:, and SB11:. (Device addresses are octal.)

Following standard RSX-11M/RSX-11M-PLUS addressing conventions, DECdataway addressing continues across controller boundaries. If the highest configured address on the first controller were SB37:, the first address on the second controller (its broadcast channel) would be SB40:. On a four-controller system, with all DECdataway addresses used, the highest possible address is SB377:.

Figure 2-1 shows an example of DECdataway addressing.

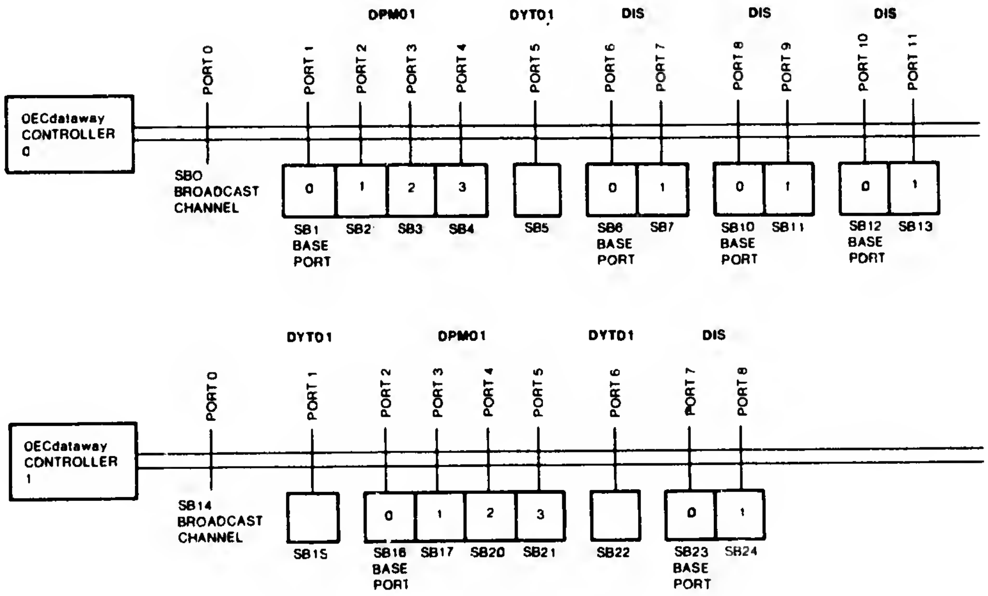


Figure 2-1 Example of DECdataway Addressing

During the host build procedure you specify the number of ports on each controller. After system start-up, you assign specific device types to DECdataway addresses with CBC.

Chapter 4 describes the host build procedure. Utilities are described in Chapter 9 of this manual.

2.3 PORTS WITHIN A MULTIPLEXER

The four terminal interfaces within a DPM01 or VT110 are sometimes referred to as "ports" 0,1,2, and 3. Figure 2-1 shows the port numbers within a multiplexer. (Note also that a multiplexer has only one physical connection to the DECdataway cable.)

Do not confuse these internal multiplexer "port" numbers with port numbers on a given DECdataway controller. The utility ATGEN defines an attribute file for DPM01, VT110, or DYT01 devices, and requests DECdataway port numbers. ATGEN is described in Chapter 6 of this manual.

PART II
SYSTEM GENERATION

CHAPTER 3
DPM/DPM-PLUS SYSTEM GENERATION OVERVIEW

3.1 STEPS IN DPM/DPM-PLUS GENERATION

You always start building a DPM/DPM-PLUS host system as follows:

- Generate the host RSX-11M or RSX-11M-PLUS operating system. In order for DPM to work, you must select certain options in the operating system. Chapter 4 of this manual contains the required answers to SYSGEN questions, for RSX-11M and RSX-11M-PLUS generation. Please read it before attempting SYSGEN.

  During SYSGEN, you have the opportunity to create partitions using VMR by editing and executing the indirect command file SYSVMR.CMD at the end of SYSGEN Phase II.

  You can create all partitions during SYSGEN (before you have actually built the DPM/DPM-PLUS software), or you can run VMR after DPMHST.CMD. To assist you in designing a partition layout, the *DPM V4.1/DPM-PLUS V1.1 Release Notes* lists the sizes of selected DPM/DPM-PLUS components.

- Build the DPM/DPM-PLUS host software. You copy the direct command file DPMHST.CMD from the distribution medium, then execute it. DPMHST.CMD is an automated procedure similar to SYSGEN. You type answers to questions about your DPM configuration and options. Based on your answers, the procedure assembles and task-builds DPM host software, creates the system configuration file, and transfers task-image software to your library device. Section 4.4 describes how to build host software.

What you do immediately following the host build depends upon your system.

- If your DPM or DPM-PLUS system uses the Factory Data Management (FDM) Dispatcher, DPMHST.CMD invites you to execute another indirect command file. Section 4.5 explains how to build the FDM Dispatcher.

  On DPM-PLUS systems, the host build procedure also builds the Application Terminal Support (ATS) Dispatcher; you do not execute a separate command file.

- Create the host system partitions, if you did not create them during SYSGEN.

- If your system includes DIS remote nodes, generate the remote system after the host build.

Building a remote system is similar to building a host system:

- Generate the remote RSX-11S operating system. Chapter 5 lists the relevant SYSGEN questions with appropriate answers.

- Build the DIS remote software. You copy the indirect command file DPMRMT.CMD from the distribution medium, then execute it. Based on your answers to dialogue questions, DPMRMT.CMD assembles and task-builds the remote software. Section 5.3 describes the remote build procedure.

- After the remote build, set up the remote system image on a host disk. Section 5.3.4 has an example of using VMR to create partitions; install, fix, and run tasks; and load the drivers.

If you will have more than one DIS node, and the remote system images will not be identical, then you repeat the remote build procedure for each DIS.

3.2 MAKING CHANGES AFTER DPM/DPM-PLUS GENERATION

You can make different levels of changes to an existing DPM/DPM-PLUS system. A change to the system may not require a complete regeneration.

If you perform a new SYSGEN to build a new version of the host operating system, then you must perform a new, standard host build. A standard host build is a complete generation of all DPM/DPM-PLUS host software. You request a standard host build by invoking DPMHST.CMD, without additional keywords. In a standard host build, you specify the DECdataway configuration, assemble and task-build the full complement of host software, and transfer all task images supplied in the distribution kit.

If you change the basic DECdataway configuration, you usually need not perform another SYSGEN; you perform only another standard DPM host build. Some examples of basic DECdataway configuration changes are:

- Adding DECdataways

- Adding a new type of DECdataway device

- Adding many devices, in excess of the maximum number of ports you originally configured for a DECdataway

If you need to apply patches to DPM/DPM-PLUS software, you perform only a partial (nonstandard) host build. You request a partial host build by invoking DPMHST.CMD, with the additional keyword PATCH. In a partial host build, you may optionally respecify the DECdataway configuration; optionally assemble and task-build each DPM/DPM-PLUS component; and optionally transfer distribution software.

If you need to reassign DECdataway addresses, no host build is necessary. You can use the utility CBC.

3.3 MEDIA, DEVICES, AND UICs

DPM software is distributed on magnetic tape and disk. DPM-PLUS software is distributed only on magnetic tape. You use the BRU utility to transfer files from the distribution kit.

Table 3-1 lists the contents of UICs on the distribution kit.

Table 3-1 Contents of DPM/DPM-PLUS Distribution Kit

UIC	Contents
[1,24]	Command files DPMHST.CMD, DPMRMT.CMD, CONFIG.CMD.
[150,10]	Host software source files.
[150,24]	Command files for building host software. Object, object library, and overlay descriptor (.OBJ, .OLB, and .ODL) files for host software.
[150,54]	Task images of nonprivileged host software; microcode files.
[151,10]	Remote software source files.
[151,20] (unmapped) [151,24] (mapped)	Command files for building remote software. Object, object library, and overlay descriptor (.OBJ, .OLB, and .ODL) files for remote software.
[151,60] (unmapped) [151,64] (mapped)	Task images of some remote software.
[152,10]	Source files, object files, task images, and command files for building FDM Dispatcher tasks.

DPMHST.CMD uses logical device names when it transfers files from the distribution kit and when it creates command, map, and list files. The procedure asks you to specify the physical devices to which the logical device names are to be assigned. This allows you to store the files for a later DPM/DPM-PLUS build on devices other than the system device (SY:). The build procedure uses the following logical device names:

SR:	source file device
CM:	command file device
OJ:	object library device
TS:	task image device (At the end of host build, the task images are transferred from TS: [150,54] to LB:[1,54]; the files in TS:[150,54] are deleted.)
MP:	map device
LI:	listing device

On the following page, Table 3-2 lists the locations of files after DPM/DPM-PLUS generation.

Table 3-2 Locations of Files After DPM/DPM-PLUS Generation

Location	Contents
LB:[1,2]	Microcode files.
LB:[1,24]	DPMHST.CMD, DPMRMT.CMD
CM:[1,24]	CONFIG.CMD.
LB:[1,54]	Host task images.
LB:[1,60]	Unmapped remote task images.
LB:[1,64]	Mapped remote task images.
SR:[150,10]	Host software source files. Configuration file SBDEF.MAC.
SR:[151,10]	Remote software source files.
OJ:[150,24]	Host object library.
OJ:[151,20]	Unmapped remote object library.
OJ:[151,24]	Mapped remote object library.
CM:[150,24]	Host command files.
CM:[151,20]	Unmapped remote command files.
CM:[151,24]	Mapped remote command files.
MP:[150,34]	Host task map files.
MP:[151,30]	Unmapped remote task map files.
MP:[151,34]	Mapped remote task map files.
LI:[150,34]	Host listing files.
LI:[151,30]	Unmapped remote listing files.
LI:[151,34]	Mapped remote listing files.
FD:[152,10]	All FDM Dispatcher files.

3.4 POOL SPACE UTILIZATION

Certain DPM/DPM-PLUS software components require for their exclusive and permanent use a fixed amount of the system's dynamic storage region ("pool"). They may also use additional pool space temporarily, depending on system activity. The following sections describe how to calculate the amount of pool space overhead.

3.4.1 SBDRV Pool Requirements

The DECdataway controller driver (SBDRV) uses a fixed amount of pool space, as follows:

For DPM,

P = 72. + (32. * ISB) + (46. * UNITS)

For DPM-PLUS (with SBTACP),

P = 42. + (32. * ISB) + (66. * UNITS)

For DPM-PLUS (without SBTACP),

P = 42. + (32. * ISB) + (54. * UNITS)

where:

P	is the SBDRV pool space utilization in decimal bytes
ISB	is the number of DECdataway controllers on the host
UNITS	is the total number of DECdataway ports configured during the host build procedure

3.4.2 DPM50H Pool Requirements

The host network ACP (DPM50H) uses a fixed amount of pool space, as follows:

P = 98. + (28. * DIS)

where:

P	is the DPM50H fixed pool space utilization in decimal bytes
DIS	is the number of DISs with which the host may communicate simultaneously (specified during host build)

DPM50H also uses the following amount of pool space temporarily:

- 176 (decimal) bytes per open DIS
- At least 70 (decimal) bytes per logical connection

3.4.3 SBTACP Pool Requirements

The DPM-PLUS Terminal ACP (SBTACP) uses a fixed amount of pool space, as follows:

P = 8. * MUX

where:

P	is the SBTACP fixed pool space utilization in decimal bytes
MUX	is the number of DPM01, VT110, or DYT01 ports configured

SBTACP also uses the following amounts of pool space temporarily for buffers, depending on the QIO function it provides:

- IO.KIL requires 8 (decimal) bytes.
- IO.RLB and IO.RVB require BUF+4 bytes, where BUF is the buffer size. (Maximum pool utilization is 140 decimal bytes.)
- IO.WVB requires BUF bytes if the write buffer begins on an odd-byte boundary. (FORTRAN programs may generate such QIOs.)

3.4.4 DPM50R Pool Requirements

In a DIS, the network ACP (DPM50R) has a fixed node pool requirement of 338 (decimal) bytes. DPM50R also uses temporarily 44 (decimal) bytes per logical connection.

CHAPTER 4
HOST GENERATION

4.1 STEPS IN HOST GENERATION

The main steps in generating a DPM/DPM-PLUS host system are:

1. Apply autopatch to a copy of the operating system distribution kit.

2. Generate the host operating system. You must select certain options in the operating system in order to support the DPM software. Sections 4.2 and 4.3 contain the guidelines for RSX-11M and RSX-11M-PLUS SYSGEN, respectively.

3. Generate the DPM or DPM-PLUS host software. For DPM, your system disk may be a small disk—RK05, RK06, RL01, or RL02. If so, you must delete some files in order to free enough disk blocks for the DPM host build procedure. See Section 4.2 for details. Section 4.4 tells how to execute the indirect command file DPMHST.CMD to build the DPM/DPM-PLUS host software.

Figure 4-1 summarizes the steps in generating a DPM/DPM-PLUS host system.

4.2 GUIDELINES FOR RSX-11M SYSTEM GENERATION

Before starting SYSGEN, bootstrap the mapped baseline system. Please consult the *RSX-11M/M-PLUS System Generation Manual*, Appendix G, Table G-1.

This question appears in the TARGET CONFIGURATION section:

15. HIGHEST INTERRUPT VECTOR (IF 0 WILL BE COMPUTED) [O R:0-774]:

    Answer 424.

If you have a magnetic tape DPM distribution kit, you must build the magnetic tape driver (MM, MS, or MT) in order to perform the DPM host generation.

If you have a small system disk, you may have to delete some files before doing a DPM host build. See *DPM V4.1/DPM-PLUS V1.1 Release Notes* for component sizes.

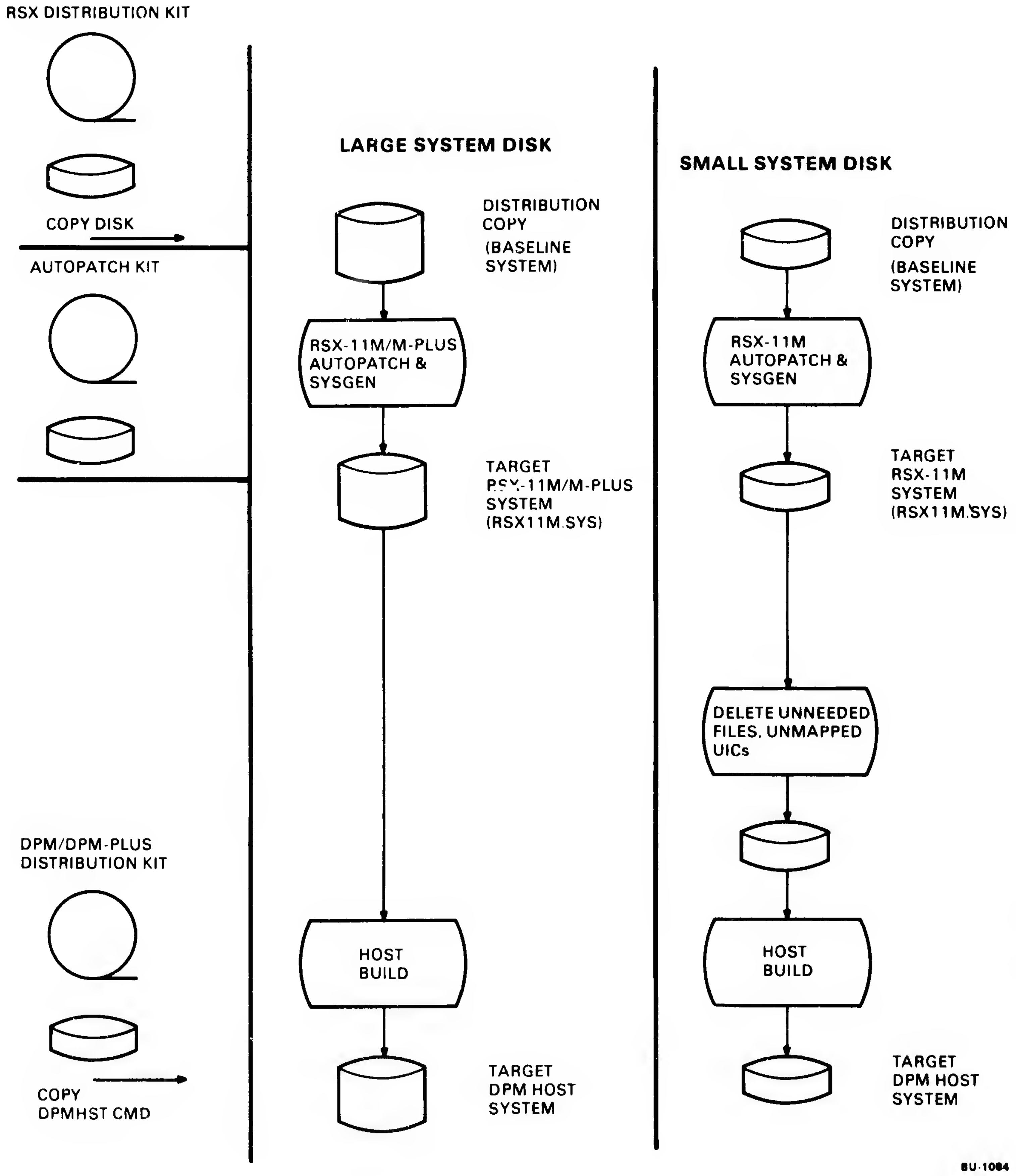

RSX DISTRIBUTION KIT
COPY DISK
AUTOPATCH KIT
LARGE SYSTEM DISK
DISTRIBUTION COPY (BASELINE SYSTEM)
RSX-11M/M-PLUS AUTOPATCH & SYSGEN
TARGET RSX-11M/M-PLUS SYSTEM (RSX11M.SYS)
HOST BUILD
TARGET DPM HOST SYSTEM
SMALL SYSTEM DISK
DISTRIBUTION COPY (BASELINE SYSTEM)
RSX-11M AUTOPATCH & SYSGEN
TARGET RSX-11M SYSTEM (RSX11M.SYS)
DELETE UNNEEDED FILES, UNMAPPED UICs
HOST BUILD
TARGET DPM HOST SYSTEM
DPM/DPM-PLUS DISTRIBUTION KIT
COPY DPMHST CMD
BU-1084

Figure 4-1 Steps in DPM/DPM-PLUS Host Generation

4.3 GUIDELINES FOR RSX-11M-PLUS SYSTEM GENERATION

There are no special guidelines for generating RSX-11M-PLUS. The options required by DPM-PLUS are included automatically.

This question appears in the TARGET CONFIGURATION section:

15. HIGHEST INTERRUPT VECTOR (IF 0 WILL BE COMPUTED) [O R:0-774]:

    Using standard DPM vector addresses, the highest address is 434 for four controllers.

4.4 BUILDING THE HOST SOFTWARE

4.4.1 Preparing to Build the Host Software

Log on to a privileged account.

Install LBR, BRU, PIP, MACRO and TKB.

If you have a magtape distribution kit, load the magtape driver. On an RSX-11M-PLUS system, issue a MOUnt command for the tape drive using the FOREIGN keyword.

Transfer the DPM host build file as follows.

For an 800-bpi TAPE distribution kit,

```
>BRU /REW/NOINIT/NEW/BACK:CMD   dev:[1,24]DPMHST.CMD   LB:
```

For a 1600-bpi TAPE distribution kit,

```
>BRU /REW/NOINI/NEW/DENS:1600/BAC:CMD   dev:[1,24]DPMHST.CMD   LB:
```

For a DISK distribution kit,

```
>BRU /NOINIT/NEW/MOU   dev:[1,24]DPMHST.CMD   LB:
```

where dev: is the distribution device

```
RSX-11M-PLUS V02 BL10   [1,54] System
>; FILE NAME - DPMHST.CMD
>;
>; VERSION 2.1  4-JUN-82
>;
>;
>;COMMAND FILE TO CREATE THE DPM NETWORK HOST SOFTWARE
>;
>SET /BUF=TI:80.
>TIM
11:14:32 16-JUN-82
>SET /UIC=[1,24]   !SET UIC FOR PROCEDURE                              ①
>;
>* Is distribution software already on the target files-11 device(s)? [Y/N]: N
>;
>;The devices that will contain the files to be used in this dpmgen procedure
>;must be identified.
>;For example:
>;
>; 1. SOURCE DEVICE: The device that will contain all source
>;    files copied from the dpm distribution kit, and created
>;    by this dpmgen procedure.
>;
>; 2. OBJECT DEVICE: The device that will contain all object files,
>;    odl files, and object library files copied from the dpm
>;    distribution kit, and created by this dpmgen procedure.
>;
>; 3. COMMAND FILE DEVICE: The device that will contain all the command
>;    files and build files copied from the dpm distribution kit,
>;    and created by this dpmgen procedure.
>;
>; *  PLEASE NOTE THAT ALL TASK IMAGE AND MICROCODE FILES
>;    DISTRIBUTED AS PART OF THE DPM KIT AND CREATED BY THIS
>;    DPMGEN PROCEDURE WILL AUTOMATICALLY BE PUT ON THE
>;    SYSTEM LIBRARY DEVICE (LB:) AS PART OF THE DPMGEN PROCEDURE.
>;
>* Enter name of distribution kit device  [SY:] [S]: MS:
>MOU MS:/FOR/DENS=1600
>* Enter name of source device  [SY:] [S]: LB:
>ASN LB:=SR:
>;
>* Enter name of command file device  [SY:] [S]: LB:
>ASN LB:=CM:
>* Enter name of object, odl, and object library device  [SY:] [S]: LB:   ②
>ASN LB:=OJ:
>ASN LB:=OD:
>ASN LB:=OL:
>* Enter name of task image device  [SY:] [S]: LB:
>ASN LB:=TS:
>ASN LB:=TK:
>;
>BRU/BAC:CMD/REW/NOINI/NEW/DEN:1600  MS:[1,24]CONFIG.CMD LB③
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed
```

4.4.2 Standard Host Build Procedure

The standard procedure always defines the DECdataway configuration, assembles and task-builds the "standard" complement of host software, and transfers all the distribution files. The description which follows is a numbered commentary keyed to the console listing of a typical standard host build.

To begin, log on to a privileged account and type:

```
@LB:[1,24]DPMHST
```

① If you want to use a distribution kit already transferred to the system disk in a previous host build, answer Y.

② You identify the physical devices to associate with DPMHST's logical device names. See Chapter 3. If you are using distribution software from a previous build, DPMHST looks for source and object files on SR: and OJ:, respectively.

③ DPMHST copies the indirect command file CONFIG.CMD, and executes it. CONFIG asks the DECdataway configuration questions which follow. CONFIG creates the DECdataway configuration file LB:[150,10]SBDEF.MAC. Most DPM software modules require symbols in SBDEF.MAC in order to assemble.

```
>;
>;Examine and/or create DECdataway configuration file
>;
>;
>;For identification purposes, a label may be entered into the
>;configuration file.  It will appear as a comment.
>;
>* Enter a configuration label [S R:1.-20.]: SAMPLE④
>* Do you want DIS support? [Y/N]: Y
>* Enter number of DIS's to support simultaneously [D]: 5
>* Do you want terminal ACP support? [Y/N]: Y
>;
>; In order to configure your DECdataway system you need to define certain
>;static parameters (number of controllers, controller CSR addresses and
>;number of ports on the controller) and some relatively dynamic parameters (the
>;specific assignments of devices to port addresses).  You may define all the
>;required parameters during the following dialogue or you may define only the
>;static parameters at this time and use CBC to make device assignments later.
>;If you define only the static parameters at this time, all the devices on the
>;DECdataway will be configured as RT80X's.
>* Do you want to make device assignments now? [Y/N]: Y
>* How many DECdataway controllers (ISB11's) do you have [D R:1.-4.]: 4
>* What is the vector address of Controller A [O D:400]:
>* What is the CSR address of Controller A [O D:160140]:⑤
>;In addition to the broadcast channel.....
>*  How many (octal) ports will Controller A have  [O R:1-77]: 40⑥
>;Controller A will have 41 ports (SB0: through SB40:)
>; Enter base port numbers in octal (separated by commas) of DPM01/VT110
>* multiplexers [S]: 1,5
>; Enter base port numbers (separated by commas) of DIS subsystems
>*  [S]: 20,22,24
>; Enter port numbers (separated by commas) of DYT01 terminal interfaces
>*  [S]: 12,13
>* What is the vector address of Controller B [O D:410]:
>* What is the CSR address of Controller B [O D:160150]:
>;In addition to the broadcast channel.....
>*  How many (octal) ports will Controller B have  [O R:1-77]: 40
>;Controller B will have 41 ports (SB41: through SB101:)
>; Enter base port numbers in octal (separated by commas) of DPM01/VT110
>* multiplexers [S]: 10,14,20
>; Enter base port numbers (separated by commas) of DIS subsystems
>*  [S]: 1,3,5
>; Enter port numbers (separated by commas) of DYT01 terminal interfaces
>*  [S]: 25
>* What is the vector address of Controller C [O D:420]:
>* What is the CSR address of Controller C [O D:160160]:
>;In addition to the broadcast channel.....
>*  How many (octal) ports will Controller C have  [O R:1-77]: 40
>;Controller C will have 41 ports (SB102: through SB142:)
>; Enter base port numbers in octal (separated by commas) of DPM01/VT110
>* multiplexers [S]: 10
>; Enter base port numbers (separated by commas) of DIS subsystems
>*  [S]: 1,3
>; Enter port numbers (separated by commas) of DYT01 terminal interfaces
>*  [S]: 15,16,17
>* What is the vector address of Controller D [O D:430]:
>* What is the CSR address of Controller D [O D:160170]:
>;In addition to the broadcast channel.....
>*  How many (octal) ports will Controller D have  [O R:1-77]: 40
>;Controller D will have 41 ports (SB143: through SB203:)
>; Enter base port numbers in octal (separated by commas) of DPM01/VT110
>* multiplexers [S]: 1,5
>; Enter base port numbers (separated by commas) of DIS subsystems
>*  [S]: 12,14,16
>; Enter port numbers (separated by commas) of DYT01 terminal interfaces
>*  [S]: 22,23
>;                                                                  ⑦
>; If you have made an error specifying your configuration you may
>; repeat this section of the generation procedure by responding
>; "Y" to the following question.
>* Do you want to repeat this part of the generation procedure? [Y/N]: N
```

④ You may define a string identification or label for the configuration you will define in this particular instance of CONFIG. The identification appears in SBDEF.MAC, and allows you to distinguish between configurations defined in different host builds.

⑤ In DPM systems, DECdataway controllers are designated 0,1,2, and 3.

In DPM-PLUS systems, DECdataway controllers are designated A,B,C, and D.

⑥ Compute the number of DECdataway ports used as follows:

N = (RT80x) + (MUX * 4) + (DYT01) + (DIS * 2)

where:

RT80x is the number of RT801, RT803, and RT805 terminals.

MUX is the number of DPM01 and VT110 terminal multiplexers.

DYT01 is the number of DYT01 DECdataway terminal interfaces.

DIS is the number of DPM50 and DPM23 DECdataway Intelligent Subsystems.

⑦ The network software will be built to support simultaneously the number of DIS nodes you specify.

```
>;
>; Now that all devices assignments have been made you must run the
>; CBC utility to change the assignment from an RT80X to the appropriate
>; device.  A command file LB:[1,24]CBC.CMD has been created for
>; you during this procedure with your device assignments. Before trying
>; to use any of the devices run the command file by entering:
>; CBC @LB:[1,24]CBC and the appropriate assignments will be made.
>;
>; There are two utilities that must be run before you attempt to use
>; any DPM01/VT110's or DYT01's. First run the attribute generator
>; program, ATGEN.  Then run the load attributes program, LAT.  A
>; LAT command file LB:[1,24]LAT.CMD was created for you during this
>; procedure with all of your DPM01/VT110 and DYT01 assignments.Invoke
>; this file by entering: LAT @LB:[1,24]LAT and all attributes will be
>; assigned.
>;
>;All partition names will default to "GEN".
>;Tasks built in the "GEN" partition, may be installed in another
>;partition by using the following type of command: INS $FILENAME/PAR=PARTITION
>;
>;
>;
>;How many terminals should the terminal ACP (SBTACP) support ⑧
>*  [D R:1.-249. D:50.]:
>;How many terminals should the dispatcher (DSP) support ⑨
>*  [D R:1.-249. D:50.]:
>;
>;The ATS dispatcher can allow any terminal user to run tasks, or it can
>;require a user to log on to the dispatcher first.
>;
>* Want any user to be able to run tasks? [Y/N]: ⑩
>;
>;Each logged on user is limited to running a pre-defined set of tasks.
>;Optionally, additional restrictions may be placed on the user:  a user can be
>;limited to logging on only at specific terminals, and/or the set of tasks
>;available can depend on the user'S terminal.
>;
>* Want the optional terminal restrictions? [Y/N]: ⑪
>;
>* Want assembly listings? [Y/N]: Y
>* Enter listing output device  [SY:] [S]: LB: ⑫
>ASN LB:=LI:
>* Want to spool the assembly listings? [Y/N]: N
>* Want cross-reference listings? [Y/N]: N
>* Want task build maps? [Y/N]: Y
>* Enter map output device  [SY:] [S]: LB:
>ASN LB:=MP:
>* Want to spool load maps? [Y/N]: N
>* Want global cross-references? [Y/N]: N
>;
>;The DPM network'S host generation procedure must have access to the
>;conditional assembly configuration file that was produced by the rsx-11m ⑬
>;system generation procedure.
>;
>* Is DR1:[11,10]RSXMC.MAC your RSX-11M configuration file? [Y/N]: N
>* Enter configuration file as DDU:[N,M]FILE.EXT [S]: DR:[11,10]RSXMC.MAC
>;
>;The configuration file will now be checked for validity.
>;DR0:[11,10]RSXMC.MAC;7 is correct for this gen.
>;
>;
>* Will you want to edit any of the source or command files? [Y/N]: N
>* Want to add the DIS FORTRAN library (FORINT) routines to SYSLIB? [Y/N]: Y ⑭
>* Want to add the DIS FORTRAN library (GETNOD) routines to SYSLIB? [Y/N]: Y
>;
>;Command files to do all the assemblies, taskbuilds, and library builds
>;required for this DPMGEN will now be created.
>;any source files required will be copied from the distribution medium. ⑮
```

(8) Under DPM-PLUS, the terminal ACP (SBTACP) automatically mounts DPM01, VT110, or DYT01 terminals. Your answer to this question determines the maximum number of terminals that may be mounted. If your configuration has more DPM01, VT110, or DYT01 terminals than this number (n), only the terminals with the n lowest DECdataway addresses get mounted; SBTACP reports the unmounted terminals in its console messages, described in Chapter 10.

(9) This is the maximum number of DPM01, VT110, or DYT01 and local (TT:) terminals that you may simultaneously connect to the ATS Dispatcher using the CDU utility. See Section 9.3.2.

(10) Answer N to select System Protection. Users will have to log in to the ATS Dispatcher.

A Y response selects no System Protection. Anyone will be allowed to use DSP-connected terminals. DPMHST asks three additional questions. The first question asks if you wish to select Limited Task Protection. The second and third questions ask you to supply the group and member codes of the default UIC under which dispatched tasks will run.

See Section 6.3 for the control files you will need to create. Also see Chapter 6 of the *DPM/DPM-PLUS Terminal User's Guide* for a full description of the forms of protection that DSP can be built to support.

(11) Answer Y to select Terminal-Based Protection.

See Section 6.3 for the control files you will need to create. Also see Chapter 6 of the *DPM/DPM-PLUS Terminal User's Guide* for a full description of the forms of protection that DSP can be built to support.

(12) Specify devices and options for maps and assembly listings, if desired.

(13) DPMHST expects to find RSXMC.MAC in the UIC where SYSGEN normally creates it. If you have moved or renamed RSXMC.MAC, answer appropriately. The RSXMC.MAC file you specify must correspond to the DPM/DPM-PLUS host operating system. DPMHST validates the file. If the RSXMC.MAC you specified is invalid, DPMHST pauses to allow you to locate the proper file.

(14) DPMHST determines whether to update SYSLIB with DIS FORTRAN routines. If you decline to update SYSLIB during the host build procedure, you may do so at a later time by issuing the following commands:

```
LBR LB:[1,1]SYSLIB/RP=OJ:[150,24]FORINT

LBR LB:[1,1]SYSLIB/RP=OJ:[150,24]GETNOD
```

(15) DPMHST creates the command files (on CM:) for the assemblies and task builds.

```
>;
>SET /UIC=[1,150]
>BRU/BAC:HOST/REW/NOINI/NEW/DEN:1600 MS:[150,10] SR:
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

>BRU/BAC:HOST/REW/NOINI/NEW/DEN:1600 MS:[150,24] OJ:
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed
```

⑯

```
>;
>;The DPM network host software will now be assembled and built.
>;
>SET /UIC=[1,150]
>PIP SR:[150,10]RSXMCM.MAC=DR0:[11,10]RSXMC.MAC;7,LB:[150,10]SBDEF.MAC
>PIP SR:[150,10]S.MAC;*/NM/RM
>PIP SR:[150,10]S.MAC/EN=SR:[150,10]RSXMCM.MAC
>LBR LB:[1,1]EXEMC.MLB/RP=SR:[150,10]SBPREF.MAC/SZ
Module "SBERR$" replaced

Module "SBSCB$" replaced

Module "SBTBL$" replaced

Module "SBCW3$" replaced

Module "SBUCB$" replaced

>LBR LB:[1,1]RSXMAC.SML/RP=SR:[150,10]ISBMAC.MAC/SZ
Module "ISBIO$" replaced

>LBR LB:[1,1]SYSLIB.OLB/RP=OJ:[150,24]ISBSYM
Module "ISBSYM" replaced

>LBR LB:[1,1]RSXMAC.SML/RP=SR:[150,10]DLCM/SZ,DLCMW,DLCCOM
Module "DLCM$ " replaced

Module "DLCMW$" replaced

Module "DLCCOM" replaced

>LBR LB:[1,1]SYSLIB/RP=OJ:[150,24]DLCBS
Module "DLCBS " replaced

>MAC @CM:[150,24]HOSTASM.CMD
>PIP SR:[150,10]S.MAC;*/NM/RM
>TKB @CM:[150,24]SBDRVBLD
>LBR @CM:[150,24]UPDATELIB
>TKB @CM:[150,24]ISBINIBLD
>TKB @CM:[150,24]ISBERRBLD
>TKB @CM:[150,24]ISBRPTBLD
>TKB @CM:[150,24]CBCBLD
>TKB @CM:[150,24]ISBONLBLD
>TKB @CM:[150,24]LATBLD
>LBR CM:[150,24]DLIB.OLB/RP/-EP=OJ:[150,24]GBLDEF.OB
>TKB @CM:[150,24]SPYBLD
>TKB @CM:[150,24]DSPBLD
>TKB @CM:[150,24]CDUBLD
>TKB @CM:[150,24]PRTBLD
>TKB @CM:[150,24]TACPBLD
>TKB @CM:[150,24]NIDRVBLD
>TKB @CM:[150,24]DPM50HBLD
>;
>;SYSLIB will be updated as required.
>;
>LBR LB:[1,1]SYSLIB/RP=OJ:[150,24]FORINT,GETNOD
Module "FORINT" replaced
```

⑰

⑯ DPMHST transfers source and object files from the distribution kit.

⑰ DPMHST assembles and task-builds the DPM/DPM-PLUS software and updates libraries.

```
Module "GETNOD" replaced

>UFD TS:[150,54]
>;
>;The task image and microcode files will be copied from the distribution kit.
>;
>BRU/BAC:HOST/REW/NOINI/NEW/DEN:1600 MS:[150,54] TS:
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed                                                          ⑱

>PIP LB:[1,2]/NV/CD=TS:[150,54]ISB11.,SBCNCK.
>PIP TS:[150,54]ISB11.;*/DE,SBCNCK.;*
>PIP LB:[1,54]/NV/CD=TS:[150,54]*.*
>PIP TS:[150,54]*.TSK;*/DE
>SET /UIC=[1,150]
>;
>;
>;The DPM network host generation procedure is now complete.
>;
>;
>;You must run the attribute generator program, ATGEN, before attempting
>;to use any DPM01/VT110(S).
>;
>;You should create an indirect file to install, load, mount, and
>;run the various DPM tasks and drivers.  An example of one is
>;created in "LB:[150,24]STARTUP.XMP" by each normal DPMGEN procedure.
>;
>;
>;When you have completed your RSX-11S GEN you may want to do
>;a DPM REMOTE GEN, or a FDM DISPATCHER GEN for your system.
>;
>;FDM dispatcher software is on volume two of the distribution kit.
>; BRU/BAC:FDM/REW/NOINI/NEW/DEN:1600 MS:[152,10]FDMDIS.BLD LB:
>;
>;
>;To run the REMOTE and FDM DISPATCHER generation procedures, use the following ⑲
>;commands:
>;
>; @LB:[1,24]DPMRMT.CMD
>; @LB:[152,10]FDMDIS.BLD
>;
>;Pre-gened RSX-11S systems for use in remote systems are included in the
>;distributed dpm kit.
>;The files must be copied from the distribution media.  Issue the following
>;commands to copy these files from the kit, substituting 200, 201, and 202
>;for "XXX" in the UIC.
>;
>;RSX-11S systems are on volume three of the distribution kit.
>; BRU/BAC:11SGEN/REW/NOINI/NEW/DEN:1600 MS:[151,XXX] LB:
>;
>;After the files have been copied from the distribution kit,
>;issue the following command to obtain more information on the RSX-11S systems.
>;
>; @LB:[151,200]REMOTE.INF
>;
>ASN =SR:
>ASN =CM:
>ASN =OJ:
>ASN =OD:
>ASN =OL:
>ASN =TS:
>ASN =TK:
>ASN =LI:
>ASN =MP:
>TIM
11:51:02 16-JUN-82
>@ <EOF>
```

⑱ DPMHST transfers task image and microcode files from the distribution kit to LB:, and uses PIP to move them to their destination UICs.

⑲ DPMHST invites you to build the FDM Dispatcher. Refer to Section 4.5, if applicable.

```
RSX-11M-PLUS V02 BL10   [1,54] System
>; FILE NAME - DPMHST.CMD
>;
>; VERSION 2.1  4-JUN-82
>;
>;
>;COMMAND FILE TO CREATE THE DPM NETWORK HOST SOFTWARE
>;
>SET /BUF=TI:80.
>TIM
13:52:29 16-JUN-82
>SET /UIC=[1,24]   !SET UIC FOR PROCEDURE
>;
>* Is distribution software already on the target files-11 device(s)? [Y/N]: Y
>* Have you completed a dpm gen on this system before? [Y/N]: Y
>;
>;The devices that contain the files copied from the dpm distribution kit,
>;and created by the last dpmgen procedure must be identified.
>;For example:
>;
>; 1. SOURCE DEVICE: The device that contains all source
>;    files copied from the dpm distribution kit, and created
>;    by the last dpmgen procedure.
>;
>; 2. OBJECT DEVICE: The device that contains all object files,
>;    odl files, and object library files copied from the dpm
>;    distribution kit, and created by the last dpmgen procedure.
>;
>; 3. COMMAND FILE DEVICE: The device that contains all the
>;    the command files and build files copied from the dpm
>;    distribution kit, and created by the last dpmgen procedure.
>;
>; 4. TASK IMAGE DEVICE: The device that contains all the
>;    task image files copied from the dpm distribution kit.
>;
>; * PLEASE NOTE THAT ALL TASK IMAGE AND MICROCODE FILES
>;   DISTRIBUTED AS PART OF THE DPM KIT AND CREATED BY THE LAST
>;   DPMGEN PROCEDURE WERE AUTOMATICALLY PUT ON THE SYSTEM
>;   LIBRARY DEVICE (LB:) AS PART OF THE DPMGEN PROCEDURE.
>;
>* Enter name of source device  [SY:] [S]: LB:
>ASN LB:=SR:
>;
>* Enter name of command file device  [SY:] [S]: LB:
>ASN LB:=CM:
>* Enter name of object, odl, and object library device  [SY:] [S]: LB:
>ASN LB:=OJ:
>ASN LB:=OD:
>ASN LB:=OL:
>* Enter name of task image device  [SY:] [S]: LB:
>ASN LB:=TS:
>ASN LB:=TK:
>;
>* Do you want to examine or change the DECdataway configuration? [Y/N]: Y①
>;
>;Examine and/or create DECdataway configuration file
>;
>;
>; File LB:[150,10]SBDEF.MAC contains a description of your last
>; configuration generated for the DECdataway. If you want to examine
>; it before proceeding answer yes to the next query.
```

4.4.3 Nonstandard Host Build Procedure

The nonstandard procedure allows you to optionally perform each assembly, build, and file transfer in host generation. A commented console listing follows, in which only the pertinent variations from the standard host build are noted.

To begin, log on to a privileged account and type:

```
@LB:[1,24]DPMHST PATCH
```

```
>;
>* Do you want to list the configuration file? [Y/N]: Y ①
>PIP TI:=LB:[150,10]SBDEF.MAC
; CONFIGURATION IDENTIFICATION < SAMPLE >
; FILE CREATED: 16-JUN-82 11:15:01
.NLIST
LD$SB = 0  ;DECdataway DRIVER IS ALWAYS LOADABLE
I$$NHO = 0  ;THIS IS THE HOST!
DP$M50 = 0  ;TURN ON DIS SUPPORT
N$$DPM = 5.  ;NUMBER OF DIS'S TO SUPPORT SIMULTANEOUSLY
T$$ACP = 0  ;TURN ON SBTACP SUPPORT IN DRIVER
S$$B11 = 4.  ;NO. OF DECdataway CONTROLLERS
SBVECA = 400  ;VECTOR ADDRESS FOR Controller A
SBCSRA = 160140  ;CSR ADDRESS FOR Controller A
S$$BOA = 40  ;HIGHEST DECdataway ADDRESS ON Controller A
;SB0 IS THE BROADCAST ADDRESS ON DECdataway Controller A
SBVECB = 410  ;VECTOR ADDRESS FOR Controller B
SBCSRB = 160150  ;CSR ADDRESS FOR Controller B
S$$BOB = 40  ;HIGHEST DECdataway ADDRESS ON Controller B
;SB41 IS THE BROADCAST ADDRESS ON DECdataway Controller B
SBVECC = 420  ;VECTOR ADDRESS FOR Controller C
SBCSRC = 160160  ;CSR ADDRESS FOR Controller C
S$$BOC = 40  ;HIGHEST DECdataway ADDRESS ON Controller C
;SB102 IS THE BROADCAST ADDRESS ON DECdataway Controller C
SBVECD = 430  ;VECTOR ADDRESS FOR Controller D
SBCSRD = 160170  ;CSR ADDRESS FOR Controller D
S$$BOD = 40  ;HIGHEST DECdataway ADDRESS ON Controller D
;SB143 IS THE BROADCAST ADDRESS ON DECdataway Controller D
.LIST
>* Do you want to create a new configuration file? [Y/N]: N ①
>;
>; If you have made an error specifying your configuration you may
>; repeat this section of the generation procedure by responding
>; "Y" to the following question.
>* Do you want to repeat this part of the generation procedure? [Y/N]: N
>* Want to assemble any of the DPM network's host software? [Y/N]: Y
>;
>; Do you want to assemble the following:                               ②
>;
>* DECdataway (ISB11) driver (SBDRV)? [Y/N]: Y
>* DECdataway library routines? [Y/N]:
```

① You may list SBDEF.MAC, run CONFIG, do both, or proceed.

② You select which components to assemble, if any. In addition to the "standard" components, you may assemble software that is usually task-built from distribution kit object modules, or usually transferred as a task image.

```
>* DECdataway initiator task (ISBINI)? [Y/N]:
>* DECdataway event logger task (ISBERR)? [Y/N]: Y
>* DECdataway event report task (ISBRPT)? [Y/N]:
>* DECdataway bus configuration task (CBC)? [Y/N]:
>* DECdataway on-line task (ISBONL)? [Y/N]:
>* DECdataway attribute generator (ATGEN)? [Y/N]:
>* DECdataway load attributes task (LAT)? [Y/N]:
>* DECdataway dispatcher task (DSP)? [Y/N]:
>* DECdataway protection task (DSPPRT)? [Y/N]:
>* DECdataway terminal ACP (SBTACP)? [Y/N]:                        ②
>* DECdataway connect disconnect utility (CDU)? [Y/N]:
>;
>* NETWORK'S DIS stub driver (NIDRV)? [Y/N]: Y
>* NETWORK'S DIS ACP (DPM50H)? [Y/N]:
>* NETWORK'S DIS down-line load task (DLC)? [Y/N]:
>* NETWORK'S DIS up-line dump utility task (ULD)? [Y/N]:
>* NETWORK'S DIS updump utility task (UPDUMP)? [Y/N]:
>* NETWORK'S DIS auto-reboot task (DISBOO)? [Y/N]:
>* NETWORK'S DIS FORTRAN library (FORINT)? [Y/N]:
>* NETWORK'S DIS FORTRAN library (GETNOD)? [Y/N]:
>;
>;
>* Want to task build any of the DPM network's host software? [Y/N]: Y
>;
>; Do you want to task build the following:
>;
>* DECdataway driver (SBDRV)? [Y/N]: Y
>* DECdataway initiator task (ISBINI)? [Y/N]:
>* DECdataway event logger task (ISBERR)? [Y/N]: Y
>* DECdataway event report task (ISBRPT)? [Y/N]:
>* DECdataway bus configuration task (CBC)? [Y/N]:
>* DECdataway on-line utility task (ISBONL)? [Y/N]:
>* DECdataway attribute generator (ATGEN)? [Y/N]:
>* DECdataway load attributes task (LAT)? [Y/N]:                              ③
>* DECdataway Status display task (SPY)? [Y/N]:
>* DECdataway dispatcher task (DSP)? [Y/N]:
>* DECdataway protection task (DSPPRT)? [Y/N]:
>* DECdataway terminal acp (SBTACP)? [Y/N]:
>* DECdataway connect disconnect utility (CDU)? [Y/N]:
>;
>* NETWORK'S DIS stub driver (NIDRV)? [Y/N]: Y
>* NETWORK'S DIS ACP (DPM50H)? [Y/N]:
>* NETWORK'S DIS down-line load utility (DLC)? [Y/N]:
>* NETWORK'S DIS up-line dump utility (ULD)? [Y/N]:
>* NETWORK'S DIS updump utility task (UPDUMP)? [Y/N]:
>* NETWORK'S DIS auto-reboot task (DISBOO)? [Y/N]:
>;
>* Want to create a new DECdataway library (ISBLIB)? [Y/N]: Y
>;
>;All partition names will default to "GEN".
>;Tasks built in the "GEN" partition, may be installed in another
>;partition by using the following type of command: INS $FILENAME/PAR=PARTITION
>;
>;
```

③ You select which components to task-build, if any.

```
>;
>;
>* Want assembly listings? [Y/N]: Y
>* Enter listing output device  [SY:] [S]: LB:
>ASN LB:=LI:
>* Want to spool the assembly listings? [Y/N]: N
>* Want cross-reference listings? [Y/N]: N
>* Want task build maps? [Y/N]: Y
>* Enter map output device  [SY:] [S]: LB:
>ASN LB:=MP:
>* Want to spool load maps? [Y/N]: N
>* Want global cross-references? [Y/N]: N
>;
>;The DPM network'S host generation procedure must have access to the
>;conditional assembly configuration file that was produced by the rsx-11m
>;system generation procedure.
>;
>* Is DR1:[11,10]RSXMC.MAC your RSX-11M configuration file? [Y/N]: N
>* Enter configuration file as DDU:[N,M]FILE.EXT [S]: DR0:[11,10]RSXMC.MAC
>;
>;The configuration file will now be checked for validity.
>;DR0:[11,10]RSXMC.MAC;7 is correct for this gen.
>;
>;
>* Will you want to edit any of the source or command files? [Y/N]: N ④
>;
>;Command files to do all the assemblies, taskbuilds, and library builds
>;required for this DPMGEN will now be created.
>;
>SET /UIC=[1,150]
>;
>;The DPM network host software will now be assembled and built.
>;
```

④ If you answer Y, DPMHST will pause later to give you the opportunity to apply patches using your favorite editor.

```
>SET /UIC=[1,150]
>PIP SR:[150,10]RSXMCM.MAC=DR0:[11,10]RSXMC.MAC;7,LB:[150,10]SBDEF.MAC
>PIP SR:[150,10]S.MAC;*/NM/RM
>PIP SR:[150,10]S.MAC/EN=SR:[150,10]RSXMCM.MAC
>LBR LB:[1,1]EXEMC.MLB/RP=SR:[150,10]SBPREF.MAC/SZ
Module "SBERR$" replaced

Module "SBSCB$" replaced

Module "SBTBL$" replaced

Module "SBCW3$" replaced

Module "SBUCB$" replaced

>LBR LB:[1,1]RSXMAC.SML/RP=SR:[150,10]ISBMAC.MAC/SZ
Module "ISBIO$" replaced

>LBR LB:[1,1]SYSLIB.OLB/RP=OJ:[150,24]ISBSYM
Module "ISBSYM" replaced

>MAC @CM:[150,24]HOSTASM.CMD
>PIP SR:[150,10]S.MAC;*/NM/RM
>TKB @CM:[150,24]SBDRVBLD
>LBR @CM:[150,24]ISBLIBBLD
Module "$SHORT" replaced

Entry points deleted:
$ERTXT

Module "IEDMSG" replaced

Module "ISBFIL" replaced

Module "OPNBLK" replaced

Module "QIO$  " replaced

Module "SBCSUB" replaced

Module "ISBMSG" replaced

Module "ISBFUL" replaced

Module "PWRFL " replaced

>LBR @CM:[150,24]UPDATELIB
Module "ISBERR" replaced

>TKB @CM:[150,24]ISBERRBLD
>TKB @CM:[150,24]NIDRVBLD
>SET /UIC=[1,150]
>;
```

```
>;
>;The DPM network host generation procedure is now complete.
>;
>;
>;You should create an indirect file to install, load, mount, and
>;run the various DPM tasks and drivers.  An example of one is
>;created in "LB:[150,24]STARTUP.XMP" by each normal DPMGEN procedure.
>;
>;
>;When you have completed your RSX-11S GEN you may want to do
>;a DPM REMOTE GEN, or a FDM DISPATCHER GEN for your system.
>;These files should already have been copied from the distribution kit.
>;To run the REMOTE and FDM DISPATCHER generation procedures, use the following
>;commands:
>;
>; @LB:[1,24]DPMRMT.CMD
>; @LB:[152,10]FDMDIS.BLD
>;
>;Pre-gened RSX-11S systems for use in remote systems are included in the
>;distributed dpm kit.
>;these files should already have been copied from the distribution kit.
>;issue the following command to obtain more information on the RSX-11S systems.
>;
>; @LB:[151,200]REMOTE.INF
>;
>PIP SR:[150,10]*.*/PU,OJ:[150,24]*.*,CM:[150,24]*.*
>ASN =SR:
>ASN =CM:
>ASN =OJ:
>ASN =OD:
>ASN =OL:
>ASN =TS:
>ASN =TK:
>ASN =LI:
>ASN =MP:
>TIM
14:12:50 16-JUN-82
>@ <EOF>
```

4.5 BUILDING THE FDM DISPATCHER

4.5.1 Preparing to Build the FDM Dispatcher

The FDM Dispatcher Package is distributed on its own kit. The first step is to copy the dispatcher build file onto disk.

Log on to a privileged account.

For 800-bpi TAPE distribution kits,

```
>BRU /REW/NOINIT/NEW/BACK:FDM dev:[152,10]FDMDIS.BLD LB:
```

For 1600-bpi TAPE distribution kits,

```
>BRU /REW/NOINI/NEW/DENS:1600/BAC:FDMdev:[152,10]FDMDIS.BLDLB:
```

For DISK distribution kits,

```
>BRU /NOINIT/NEW/MOU dev:[152,10]FDMDIS.BLD LB:
```

where dev: is the distribution device.

4.5.2 FDM Dispatcher Build Procedure

To build or rebuild the FDM Dispatcher Package, invoke the build procedure by typing:

```
@LB:[152,10]FDMDIS.BLD
```

This build procedure asks the operator for all parameters needed to tailor the package in accordance with a specific configuration. It is suggested that the first-time user start by using the baseline tasks, rather than regenerating any dispatcher tasks, in order to gain familiarity with the hardware and software operating procedures.

The build procedure (FDMDIS.BLD) creates a restart procedure (DISPAT.CMD), which is the recommended method for starting or restarting the dispatcher. This procedure may be invoked by typing:

```
@FD:[152,10]DISPAT
```

It could be called automatically at system startup by invoking DISPAT in the file SY:[1,2]STARTUP.CMD.

```
>;                    FDMDIS.BLD  VERSION 4.0
>;
>;
>TIM
13:50:01 16-APR-80
>;
>* WANT EXPANDED COMMENTS? [Y/N]:Y
>;
>; THIS PROCEDURE IS USED TO GENERATE THE TASKS WHICH COMPRISE THE FDM
>; DISPATCHER PACKAGE AND/OR TO START A FRESH COPY OF IT
>;
>; IT IS RECOMMENDED THAT THE FIRST-TIME USER OF THE DISPATCHER PACKAGE
>; NOT REGENERATE ANY DISPATCHER TASKS INITIALLY.  THE SET OF BASELINE
>; DISPATCHER TASKS WHICH ARE DELIVERED SHOULD SUFFICE FOR INITIAL
>; OPERATION OF RT8XX AND DPM01/VT110 TERMINALS, ANY SHOULD BE USED IN ORDER
>; TO GAIN FAMILIARITY WITH THE DISPATCHER AND THE DEVICES.
>;
>* IS FDM DISPATCHER SOFTWARE ALREADY ON THE TARGET DEVICE? [Y/N]:N
>* ENTER NAME OF DISTRIBUTION KIT DEVICE [DDU] [S]: DK1:
>;
>; THIS FDM DISPATCHER BUILD PROCEDURE USES TWO DEVICES
>; (IN ADDITION TO THE DEVICE FOR THE DISTRIBUTION KIT)
>; THESE TWO DEVICES ARE:
>;
>;     THE LIBRARY DEVICE (LB:), ONTO WHICH ALL OF THE TASK IMAGES
>;     WILL BE PLACED, ALONG WITH THE DISPATCHER DATA FILE AND THE
>;     DISPATCHER RESTART COMMAND FILE, AND FDMSAR.OBJ AND FDMSAR.ODL.
>;
>;     A TARGET DEVICE, WHICH WILL CONTAIN ALL OF THE SOURCE, OBJECT,
>;     LISTING, MAP, AND TEMPORARY WORK FILES USED BY THIS PROCEDURE.
>;
>* ENTER NAME OF TARGET DEVICE [DDU, DEFAULT=SY:] [S]: SY:
>ASN SY:=SY:
>;
>BRU /NOINIT/MOU/NEW DK1:[152,10]*.* SY:
BRU - COMPLETED
>DMO DK1:
DMO -- VOLUME NOT MOUNTED BY TI:
>PIP LB:[152,10]/NV=[152,10]FDMSAR.OBJ,FDMSAR.ODL
>PIP LB:[152,10]FDMSAR.OBJ/PU,FDMSAR.ODL
>PIP LB:[152,10]/NV/CO=[152,10]FDMDSX.TSK,FDMDSD,FDMDSP,FDMDIS,FDMDSE
>PIP LB:[152,10]FDMDSX.TSK/PU,FDMDSD,FDMDSP,FDMDIS,FDMDSE
>PIP LB:[152,10]/NV=[152,10]FDMDSF.DAT
>SET /UIC=[152,10]
>* WANT TO REGENERATE ANY DISPATCHER TASKS? [Y/N]:Y
>;
>* WANT TO GENERATE LISTINGS AND MAPS? [Y/N]:N
>;
>;
>; NORMALLY, OBJECT MODULES AND OTHER RESIDUE FROM TASK GENERATION
>; SHOULD NOT BE LEFT ON DISK.
>;
>* WANT TO LEAVE OBJECT MODULES (ETC.) ON DISK? [Y/N]:N
>;
```

```
>* WANT TO REGENERATE THE DISPATCH EXECUTIVE? [Y/N]:Y
>;
>; NOW ASK USER FOR PARAMETERS FOR BUILDING THE DISPATCH EXEC (FDMDSX).
>; FOR EXAMPLE:
>;
>;      TO USE SB1:, SB22:, AND SB177:, THE NEXT ANSWER SHOULD BE 177
>;
>;
>* ENTER HIGHEST (OCTAL) TERMINAL DEVICE NUMBER [O R:1-377 D:377]:
>;
>; NEXT, FIND OUT HOW MANY TERMINALS FDMDSX WILL CONCURRENTLY USE.
>;
>* HOW MANY (DECIMAL) DISPATCHED TERMINALS [D R:1.-250. D:250.]:
>;
>;
>; IF NO PROMPT IS SELECTED, RT803/RT805'S WILL BE TREATED AS RT801'S.
>;
>* WANT TO PROMPT FOR RT805/RT803 TRANSACTION KEYS? [Y/N]:Y
>;
>; THE MESSAGE ENTERED IS WHAT WILL BE DISPLAYED ON THE RT803/RT805
>; DISPLAY TO PROMPT THE OPERATOR TO SELECT A TRANSACTION BY
>; PUSHING A TRANSACTION KEY.  ENTER A MESSAGE, SUCH AS -
>;     'SELECT TRANSACTION KEY'
>;
>* ENTER MESSAGE [S R:1.-32.]: SELECT A FUNCTION
>;
>;
>; IF NO PROMPT IS SELECTED, DPM01/VT110'S WILL NOT BE SUPPORTED BY FDMDSX.
>;
>* WANT TO PROMPT FOR DPM01/VT110-TERMINAL TRANSACTION INDICES? [Y/N]:Y
>;
>; THE MESSAGE ENTERED IS WHAT WILL BE DISPLAYED ON THE DEVICE
>; CONNECTED TO THE DPM01/VT110 TO PROMPT THE OPERATOR TO SELECT A
>; TRANSACTION BY TYPING IN THE INDEX TO THAT TRANSACTION.
>; ENTER A MESSAGE, SUCH AS -
>;     'TYPE TRANSACTION KEY (1-99)='
>;
>* ENTER MESSAGE [S R;1.-56.]: ENTER A FUNCTION CODE (1-99)=
>;
>;
>* WANT TO LEARN ABOUT RT800 SUPPORT? [Y/N]:Y
>;
>; RT800 TERMINALS CONNECTED TO DPM01/VT110'S MAY BE USED TO INITIATE
>; TRANSACTIONS IF DESIRED, NOW THAT DPM01/VT110 SUPPORT HAS BEEN SELECTED.
>; THE NUMERIC DISPLAY WILL BE CLEARED, OR (OPTIONALLY) A MESSAGE WILL

>; BE DISPLAYED.  THE GUIDANCE LIGHTS WILL BE DARKENED, OR (OPTIONALLY)
>; ONE MAY BE LIT.  THE USER MUST ALSO ENTER A LIST OF DEVICE NUMBERS
>; OF TERMINALS TO BE TREATED AS RT800'S.
>;
>* WANT TO SUPPORT RT800 TERMINALS? [Y/N]:N
>;
>;   NOW COMPILE AND LINK THE DISPATCHER EXECUTIVE (FDMDSX).
>;
```

```
>;
>MAC FDMDSX=FDMDS1,FDMDS2,FDMDS4
>TKB @FDMDSX.TKB
>SET /UIC=[7,1]
>PIP [152,10]FDMDSX.*/PU,FDMDS1.*,FDMDS2.*,FDMDS4.*
>;
>PIP [152,10]FDMDSX.OBJ;*/DE,FDMDSX.TKB;*,FDMDS2.MAC;*
>SET /UIC=[152,10]
>;
>;
>; IF YOU WANT TO CHANGE THE NAME OF THE DISPATCH FILE, YOU MUST
>; REGENERATE OTHER DISPATCHER TASKS (FDMDSD,FDMDSP AND FDMDIS).
>; IF YOU WANT TO ADD FAST-ACCESS RECORDS TO THE DISPATCHER, YOU MUST
>; REGENERATE OTHER DISPATCHER TASKS (FDMDIS).
>;
>* WANT TO REGENERATE ANY OTHER DISPATCHER TASKS? [Y/N]:Y
>;
>;     FDMDSE, FDMDIS, FDMDSD AND FDMDSP (...FDD) ARE
>;     DELIVERED AS TASK IMAGES.  IT SHOULD NOT BE NECESSARY TO
>;     REGENERATE THESE TASKS UNLESS THE SOURCE MODULES HAVE BEEN PATCHED,
>;     OR UNLESS YOU WANT TO INCLUDE FAST-ACCESS DISPATCH RECORDS,
>;     OR UNLESS YOU WANT TO CHANGE THE NAME OF THE DISPATCH FILE.
>;
>* DO YOU WANT TO REGENERATE THESE TASKS? [Y/N]:Y
>;
>;   NOW ASSEMBLE SOME MODULES USED BY SOME OF THESE TASKS.
>;
>MAC ASCADD=ASCADD
>MAC FDMPAR=FDMPAR
>MAC FDMSAR=FDMSAR
>;
>* WANT TO LEARN ABOUT FAST-ACCESS RECORDS? [Y/N]:Y
>;
>;   FAST-ACCESS RECORDS ARE DISPATCH RECORDS WHICH ARE INCLUDED WITH
>;   FDMDIS.  THESE RECORDS, IF INCLUDED, ARE SCANNED BY FDMDIS FOR
>;   A MATCH WITH THE TRANSACTION-INITIATION EVENT, BEFORE FDMDIS
>;   SCANS THE DISPATCH FILE.  FAST-ACCESS RECORDS INCREASE THE SIZE
>;   OF FDMDIS (BY 8 WORDS PER RECORD), BUT WILL IMPROVE THE RESPONSE
>;   TIME TO TRANSACTION INITIATION BY ELIMINATING TWO OR MORE DISK

>;   ACCESSES PER TRANSACTION.  NOTE THAT, SINCE MODIFYING FAST-ACCESS
>;   DISPATCH RECORDS REQUIRES REGENERATING FDMDIS (RATHER THAN MERELY
>;   EDITING THE DISPATCH FILE), IT IS RECOMMMENDED THAT THE SET OF
>;   APPLICATION TASKS BE STABILIZED AND DEBUGGED PRIOR TO MOVING
>;   DISPATCH RECORDS FROM THE DISPATCH FILE TO FAST-ACCESS RECORDS.
>;
>* WANT TO INCLUDE FAST-ACCESS DISPATCH RECORDS? [Y/N]:Y
>;
>;
>* WANT TO CREATE A NEW SET OF FAST-ACCESS RECORDS? [Y/N]:Y
>;
>;   NOW CREATE A RECORD.
>;
>* ENTER OCTAL DEVICE NUMBER (OR * FOR WILDCARD) [S R:1-3]: 7
```

```
>;
>* ENTER TRANSACTION KEY/INDEX [S R:1-2]: F
>;
>* ENTER TASK NAME [S R:1-6]: FIRE
>;
>* WANT TO ENTER ANOTHER RECORD? [Y/N]:Y
>;
>* ENTER OCTAL DEVICE NUMBER (OR * FOR WILDCARD) [S R:1-3]: 10
>;
>* ENTER TRANSACTION KEY/INDEX [S R:1-2]: 09
>;
>* ENTER TASK NAME [S R:1-6]: PANIC
>;
>* WANT TO ENTER ANOTHER RECORD? [Y/N]:N
>;
>SET /UIC=[7,1]
>PIP [152,10]FSTREC.MAC/PU
>SET /UIC=[152,10]
>;
>;   NOTE THAT THE TERMINALS REFERRRED TO IN FAST-ACCESS RECORDS WILL
>;   NOT BE STARTED BY A FDD BEGIN COMMAND.  IT IS RECOMMENDED THAT
>;   TERMINALS REFERRED TO IN FAST-ACCESS RECORDS ALSO BE REFERRED TO
>;   IN THE FDM DISPATCH FILE, PERHAPS IN IMPLICIT DATA RECORDS.
>;
>;
>;
>;  THE DEFAULT NAME OF THE DISPATCH FILE IS 'LB:[152,10]FDMDSF.DAT'.
>;  THE NAME (SPECIFIER) MAY NOW BE CHANGED.
>;
>* WANT TO CHANGE THE NAME OF THE DISPATCH FILE? [Y/N]:Y
>;
>* ENTER NAME OF DEVICE [DDU, DEFAULT=LB:]  [S]:
>;
>* ENTER USER GROUP NUMBER [O R:1-377 D:152]: 1
>;
>* ENTER USER MEMBER NUMBER [O R:1-377 D:10]: 2
>;
>* ENTER FILE NAME (LIKE FDMDSF OR DSPTCH) [S R:1.-9.]: FDMDISP
>;
>* ENTER FILE EXTENSION (LIKE DAT OR FDG) [S R:3-3]: DAT
>;
>* FILE IS NAMED 'LB:[1,2]FDMDISP.DAT'; WANT TO CHANGE THE NAME? [Y/N]:N
>;
>;
>;  LB:[1,2]FDMDISP.DAT DOES NOT EXIST.  REMEMBER TO CREATE IT BEFORE
>;  YOU TRY TO START THE FDM DISPATCHER.
>;
>SET /UIC=[7,1]
>;
>PIP [152,10]FILNAM.MAC/PU
>SET /UIC=[152,10]
>;
>;   NOW REGENERATE FDMDSD
>;
```

```
>;
>MAC FDMDSD=FDMDSH,FILNAM,FDMDSC
>MAC FDMMCR=FDMMCR
>MAC FDMMCN=FDMMCN
>MAC FDMMCG=FDMMCG
>MAC FDMMCS=FDMMCS
>MAC FDMMCI=FDMMCI
>MAC FDMMCE=FDMMCE
>MAC FDMDIN=FDMDIN
>MAC FDMDEC=FDMDEC
>MAC FDMINV=FDMINV
>MAC FDMBEG=FDMBEG
>MAC FDMBGC=FDMBGC
>MAC FDMBGS=FDMBGS
>MAC FDMBGE=FDMBGE
>MAC FDMOPE=FDMOPE
>MAC FDMRDE=FDMRDE
>;
>;
>;
>TKB @FDMDSD.TKB
>SET /UIC=[7,1]
>PIP [152,10]FDMDSD.*/PU,FDMDSH.*,FDMDSC.*,FDMMCR.*,FDMMCN.*,FDMMCG.*
>PIP [152,10]FDMMCS.*/PU,FDMMCI.*,FDMMCE.*,FDMDIN.*,FDMDEC.*,FDMINV.*
>PIP [152,10]FDMBEG.*/PU,FDMBGC.*,FDMBGS.*,FDMBGE.*,FDMOPE.*,FDMRDE.*
>PIP [152,10]FDMDSD.OBJ;*/DE,FDMMCR.OBJ;*,FDMMCN.OBJ;*,FDMMCG.OBJ;*
>PIP [152,10]FDMMCS.OBJ;*/DE,FDMMCI.OBJ;*,FDMMCE.OBJ;*,FDMDSD.TKB;*
>PIP [152,10]FDMDIN.OBJ;*/DE,FDMDEC.OBJ;*,FDMINV.OBJ;*,FDMDSD.ODL;*
>PIP [152,10]FDMBEG.OBJ;*/DE,FDMBGC.OBJ;*,FDMBGS.OBJ;*
>PIP [152,10]FDMBGE.OBJ;*/DE,FDMOPE.OBJ;*,FDMRDE.OBJ;*
>SET /UIC=[152,10]
>;
>;   NOW REGENERATE FDMDIS
>;
>;
>MAC FDMDIS=FDMDIH,FILNAM,FSTREC,FDMDIC
>MAC DISER1=DISER1
>MAC DISER2=DISER2
>MAC DISER3=DISER3
>MAC DISER4=DISER4
>MAC DISER5=DISER5
>;
>;
>;
>TKB @FDMDIS.TKB
>SET /UIC=[7,1]
>PIP [152,10]FDMDIS.*/PU,DISER1.*,DISER2.*,DISER3.*,DISER4.*,DISER5.*
>PIP [152,10]FDMDIS.OBJ;*/DE,FDMDIS.TKB;*,FDMDIS.ODL;*
>PIP [152,10]DISER1.OBJ;*/DE,DISER2.OBJ;*,DISER3.OBJ;*
>PIP [152,10]DISER4.OBJ;*/DE,DISER5.OBJ;*
>SET /UIC=[152,10]
>;
```

```
>;   FDMDSE IS THE DISPATCH ERROR REPORTING TASK
>;
>* WANT TO REGENERATE FDMDSE? [Y/N]:N
>;
>SET /UIC=[7,1]
>PIP [152,10]ASCADD.*/PU,FDMPAR.*,FDMSAR.*;*
>PIP [152,10]ASCADD.OBJ;*/DE,FDMPAR.OBJ;*
>SET /UIC=[152,10]
>;
>* WANT TO REGENERATE THE DISPATCHER TEST TASKS? [Y/N]:N
>;
>;
>; NORMALLY, SOURCE MODULES SHOULD BE LEFT ON DISK, IN ORDER TO
>; SIMPLIFY RE-BUILDING DISPATCHER TASKS.  IF YOU HAVE A SHORTAGE OF
>; DISK OR IF YOU DO NOT PLAN ON RE-BUILDING DISPATCHER TASKS, YOU MAY
>; CHOOSE TO DELETE THE DISPATCHER SOURCE.
>;
>;
>* WANT TO DELETE ALL DISPATCHER SOURCE MODULES? [Y/N]:N
>SET /UIC=[152,10]
>;
>;
>;   A DEVICE (LIKE TT0:, CL:, LP2:, OR TT17:) IS USED FOR ERROR REPORTS BY
>;   FDMDSE (TO REPORT FDMDSX ERRORS) AND FDMDIS (TO REPORT THAT A TRANSACTION
>;   COULD NOT BE DISPATCHED TO A TASK).  IT SHOULD USUALLY BE HARD-COPY.
>;   IT SHOULD NOT BE A SPOOLED DEVICE, NOR SHOULD IT BE ATTACHED BY ANOTHER
>;   TASK.  ( BEWARE OF SPOOLED LINE PRINTERS AND LOGGED CONSOLES.)
>;
>* ENTER ERROR REPORTING DEVICE [DDU, DEFAULT=TT0:] [S]:
>;
>;   NOW DETERMINE HOW THE DISPATCHER TASKS ARE TO BE INSTALLED.
>;
>;   FIRST ASK ABOUT PARTITIONS TO BE USED -
>;   THE DEFAULT IS TO INSTALL ALL TASKS IN THE 'GEN'
>;   PARTITION, AND TO NOT FIX ANY OF THEM IN MAIN MEMORY.
>;
>;   IT IS RECOMMENDED THAT THESE DEFAULTS BE USED, AT LEAST UNTIL THE
>;   THE USER HAS GAINED FAMILIARITY WITH THE OPERATION OF THE
>;   FDM DISPATCHER PACKAGE.
>;
>* WANT TO CHANGE DEFAULT PARTITIONS FOR TASKS? [Y/N]:N
>;
>;   NOW ASK ABOUT PRIORITIES TO BE USED -
>;   DEFAULT TASK PRIORITIES ARE:
>;      FDMDSX - 75.
>;      FDMDSD AND FDMDSP - 96.
>;      FDMDIS - 97.
>;      FDMDSE - 98.
>;
>;   IT IS RECOMMENDED THAT THE DEFAULT PRIORITIES BE USED AT LEAST
>;   UNTIL THE USER HAS GAINED FAMILIARITY WITH THE OPERATION OF THE
>;   FDM DISPATCHER PACKAGE.
>;
>* WANT TO CHANGE DEFAULT PRIORITIES FOR TASKS? [Y/N]:N
```

```
>;
>;   NOW BUILD NEW INDIRECT COMMAND FILE (LB:[152,10]DISPAT.CMD) FOR RESTARTING
>;   THE ONLY VALID METHOD OF RESTART IS BY TYPING '@LB:[152,10]DISPAT.CMD'
>;
>SET /UIC=[7,1]
>PIP LB:[152,10]DISPAT.CMD/PU
>;
>;  A SAMPLE COPY OF THE DISPATCHER DATA FILE HAS BEEN COPIED FROM THE
>;  DISTRIBUTION KIT.  WHILE THIS SAMPLE WILL CERTAINLY NOT CORRESPOND
>;  WITH THE CONFIGURATION OF YOUR SYSTEM, YOU MAY WISH TO EXAMINE OR
>;  EDIT THE SAMPLE.
>;
>* WANT TO SEE THE SAMPLE DISPATCH DATA FILE? [Y/N]:Y
>PIP TI:=SY:[152,10]FDMDSF.DAT
SB* KEY=A SPEEDY
SB* KEY=01 SPEEDY
SB* KEY=B FDMDST
SB* KEY=02 FDMDST
SB2: KEY=05 XXX
SB2: KEY=06 YY
SB* KEY=* FDMCAT
SB* KEY=** FDMCAT
//
SB2:
SB3:
SB5:
SB10:
SB26:
SB27:
SB31:
SB14:
SB12:
;END
>;
>* WANT TO SPOOL THE SAMPLE DISPATCH DATA FILE? [Y/N]:N
>;
>* WANT TO EDIT THE SAMPLE DISPATCH DATA FILE? [Y/N]:N
>;
>SET /UIC=[7,1]
>;
>TIM
14:41:19 16-APR-80
>ASN =
>* WANT TO RE-START THE DISPATCHER NOW? [Y/N]:N
>@ <EOF>
@LOGOUT.CMD
>ASN =
>@ <EOF>
CONNECT TIME:  52    MINS.
CPU TIME USED: 1083  SECS.
TASK TOTAL:    84
```

CHAPTER 5
REMOTE GENERATION

5.1 STEPS IN REMOTE GENERATION

The three main steps in generating a DIS remote system are:

1. Generate the RSX-11S operating system as described. If you have a small RSX-11M system disk, you should generate the RSX-11S system on another disk copy of the RSX-11M distribution kit. See Section 5.2 for details.

2. Generate the DIS remote software. Section 5.3 tells how to execute the indirect command file DPMRMT.CMD.

3. Set up the remote system. Run VMR to create partitions, install and fix tasks, load the drivers, and run certain tasks. **(On an RSX-11M-PLUS system, you must run the RSX-11M version of VMR.)**

Figure 5-1 summarizes the steps in generating a remote DIS system under RSX-11M.

5.2 GUIDELINES FOR RSX-11S GENERATION

On an RSX-11M host, there is a potential name conflict because both the RSX-11M and RSX-11S generation procedures create a configuration file named [11,10]RSXMC.MAC. The following question appears in the first section of the RSX-11S generation procedure:

```
15. CLEAN UP FILES FROM PREVIOUS GENS? [Y/N]:
```

Unless you have previously renamed SY:[11,10]RSXMC.MAC before starting the RSX-11S generation, answer N. The RSX-11M version of the file will be preserved, and a newer RSX-11S version with the same name will be created.

NOTE

This question is not asked during RSX-11S generation on an RSX-11M-PLUS host. If you do the generation on the system disk, you are asked to specify the group code for the executive files. Specifying a number (n) causes the generation procedure to create the file [n,10]RSXMC.MAC. Specify a group code other than 11.

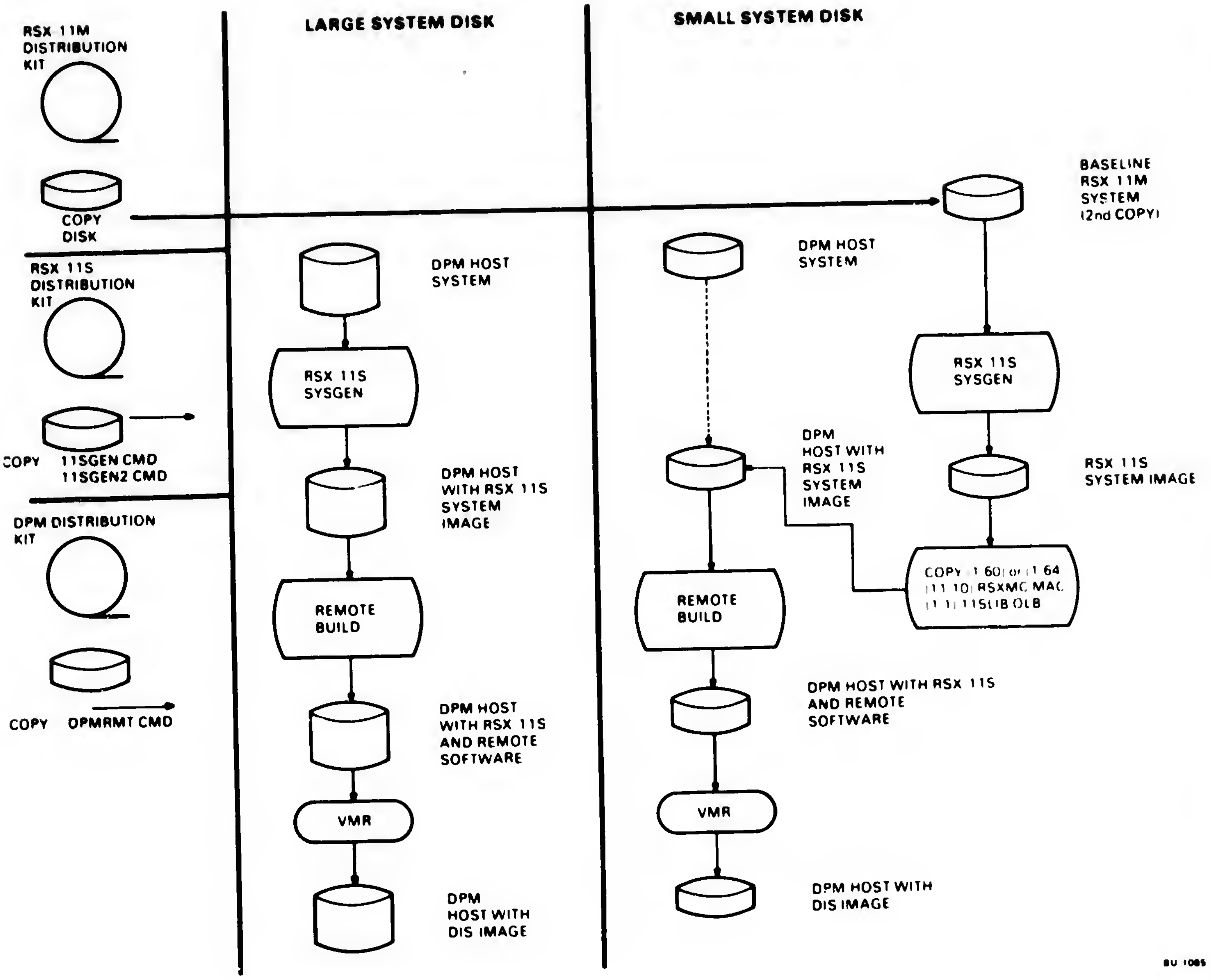


Figure 5-1 Steps in DPM Remote Generation

If you have a small RSX-11M system disk, make another copy of the RSX-11M distribution kit. Use this baseline system copy for the target RSX-11S generation. After you generate the RSX-11S system, copy the following files to the host RSX-11M disk:

[1,60]*.* (for unmapped remote systems)
[1,64]*.* (for mapped remote systems)
[11,10]RSXMC.MAC
[1,1]11SLIB.OLB

The following questions appear in the TARGET CONFIGURATION section:

1. PROCESSOR TYPE [D 11/34]:

   Answer LSI-11 or 11/23, as appropriate.

3. MEMORY SIZE (IN K-WORD BLOCKS) [D R:8.-124. D:16]:

   For an unmapped system, enter 28.

7. FLOATING INSTRUCTION SET (FIS) PRESENT? [Y/N D:N]:

   Answer Y if the answer to #1 is LSI-11. Answer N otherwise.

15. DEVICES [S]:

    All DPM50 systems have one industrial I/O subsystem. IP is optional for DPM23.

The following questions appear in the EXECUTIVE OPTIONS section and should be answered as indicated:

11. I/O RUNDOWN? [Y/N]: Y

20. POWERFAIL RECOVERY? [Y/ N]: N

    The DIS has MOS memory without battery backup; hence powerfail recovery is impossible.

30. EXECUTIVE DEBUGGING TOOL (XDT)? [Y/N]: N

    If you included XDT, the DIS would then require manual intervention every time it was downline loaded.

32. INCLUDE SUPPORT FOR COMMUNICATIONS PRODUCTS? [Y/N]: Y

37. ENTER CODE FOR SYSTEM DIRECTIVES: C

    You must select at least Send/Receive directives for DIS. Your application may require other directives.

45. SIZE OF DYNAMIC STORAGE REGION (POOL) IN WORDS [D R:256.-16384. D:1024]

50. CRASH DUMP ANALYSIS: A- PANIC B- CRASH DUMP ANALYSIS (CDA) [S]: B

    If you intend to use ULD (Up-Line Dump utility) in the host, you must select Crash dump support in the DIS. The next three questions appear if you answer "B".

51. CDA OUTPUT NOTIFICATION DEVICE CSR [O R:160000-177700 D:177564]:

    Select TT0: by accepting the default.

52. ENTER CDA MEMORY DUMP DEVICE MNEMONIC (DDU:) [S R:3-4]:

    Specify any device acceptable to SYSGEN, for example "MM0:". The device need not be present in the DIS configuration nor generated into the target system.

53. ENTER CDA MEMORY DUMP DEVICE CSR [O R:160000-177700 D:<default>]:

    Accept the default, which is the CSR address of the device specified in the last question. You must answer this question in order to satisfy SYSGEN; however, it has no effect on the operation of ULD.

The following questions appear in the PERIPHERAL CONFIGURATION section:

18. IP11 CONTROLLER 0 VECTOR [O R:60-774 D:234]: 234

19. BASE ADDRESS [O R:160000-177400 D:171000]: 171000

The following question appears in the CREATE EXECUTIVE BUILD FILES section:

8. IS DIRECT ACCESS TO THE IP11/IP300 I/O MODULES REQUIRED? [Y/N]:

    FORTRAN routines for the IP11 access the I/O page directly. If you have such applications, answer Y in order to build an appropriate device common block.

Since the DIS software is downline loaded, it is not necessary to include OTL and SIP.

Exit 11SGEN at the opportunity just prior to executing VMR. You will run VMR after building the DIS software.

5.3 BUILDING THE DIS REMOTE SOFTWARE

5.3.1 Building Software for Unmapped Systems

If you have a magnetic tape distribution kit, you must build the magnetic tape driver (MM, MS or MT) in order to perform the the DPM remote generation. If you have a small system disk, you may have to delete some files.

5.3.2 Preparing to Build the Remote Software

During the remote build procedure, you will be asked to describe the partitions for which the modules will be built. Unmapped remote systems require partition names and base addresses. Plan the partition layout for the remote RSX-11S system, considering the sizes of DIS modules. Note that ISVERR is not required, and should be omitted if the DIS system has no console terminal.

Now transfer the remote build procedure, as follows:

Log on to a privileged account.

If you have a magtape distribution kit, load the magtape driver.

On an RSX-11M-PLUS system, issue a MOUnt command for the tape drive using the FOREIGN keyword:

```
MOU dev:/FOR
```

where dev: is MM:, MT:, or MS:.

Mount the DPM/DPM-PLUS distribution kit.

Transfer the remote build file as follows:

For 800-bpi TAPE distribution kits,

```
>BRU /REW/NOINIT/NEW/BACK:CMD dev:[1,24]DPMRMT.CMD LB:
```

For a 1600-bpi TAPE distribution kit,

```
>BRU /REW/NOINI/NEW/DENS:1600/BAC:CMD dev:[1,24]DPMRMT.CMDLB:
```

For DISK distribution kits,

```
>BRU /NOINIT/NEW/MOU dev:[1,24]DPMRMT.CMD LB:
```

where dev: is the distribution device.

5.3.3 Remote Build Procedure

The description which follows is a numbered commentary keyed to the console listing of a typical remote build. A standard remote build assembles and task-builds all components. If you wish to assemble or task build only selected components, type the keyword PATCH after the name of the indirect command file (DPMRMT).

To begin, log on to a privileged account and type:

```
@LB:[1,24]DPMRMT
```

```
RSX-11M-PLUS V02 BL10   [1,54] System
>; FILE NAME - DPMRMT.CMD
>;
>; Command file to configure the DPM remote software.
>;
>; VERSION 1.28
>;
>TIM
08:52:15 11-JUN-82
>SET /BUF=TI:80.
>;
>;TYPICALLY, WHEN MULTIPLE RSX11S SYSTEMS ARE GENERATED ON A SYSTEM,
>;UNIQUE GROUP CODES ARE SPECIFIED FOR FILE STORAGE.  CODES 1, 2,
>;AND 3 COULD BE USED FOR 3 SEPARATE RSX11S GENS.  THE FILES CREATED
>;BY THESE GENS WOULD BE STORED IN UIC [1,60] [2,60] AND [3,60]
>;RESPECTIVLY FOR UNMAPPED SYSTEMS.
>;
>* Enter RSX11S group code to be used [1] [S]: 3  ①
>;
>;THE FILES EXEMC.MLB, SYSLIB.OLB, EXELIB.OLB, RSXMAC.SML, AND 11SLIB.OLB
>;FROM THE RSX-11S GEN ARE REQUIRED BY THE REMOTE GENERATION PROCEDURE.
>;THEY MUST RESIDE IN THE SAME UIC ON THE LIBRARY DEVICE, LB:.
>;THE UIC MUST BE ENTERED AS "[N,M]".
>;                                               ②
>* Enter UIC [[1,1]] [S]: [3,64]
>* Is DPM distribution software already on target files-11 device(s)? [Y/N]: N  ③
>* Have you completed a remote gen on this system before? [Y/N]: N
>;
>;THE DEVICES THAT WILL CONTAIN THE FILES TO BE USED IN THIS DPM REMOTE GEN
>;PROCEDURE MUST BE IDENTIFIED.
>;FOR EXAMPLE:
>;
>; 1. SOURCE DEVICE: THE DEVICE THAT WILL CONTAIN ALL SOURCE FILES
>;    COPIED FROM THE DPM DISTRIBUTION KIT, AND CREATED BY THIS PROCEDURE.
>;
>; 2. OBJECT DEVICE: THE DEVICE THAT WILL CONTAIN ALL OBJECT FILES,
>;    ODL FILES, AND OBJECT LIBRARY FILES COPIED FROM THE DPM
>;    DISTRIBUTION KIT, AND CREATED BY THIS DPM REMOTE GEN PROCEDURE.
>;
>; 3. COMMAND FILE DEVICE: THE DEVICE THAT WILL CONTAIN ALL THE COMMAND
>;    FILES AND BUILD FILES COPIED FROM THE DPM DISTRIBUTION KIT,
>;    AND CREATED BY THIS DPM REMOTE GEN PROCEDURE.
>;
>; *  PLEASE NOTE THAT ALL TASK IMAGE AND MICROCODE FILES
>;    DISTRIBUTED AS PART OF THE DPM KIT AND CREATED BY THIS
>;    DPM REMOTE GEN PROCEDURE WILL AUTOMATICALLY BE PUT ON THE SYSTEM'S
>;    LIBRARY DEVICE (LB:) AS PART OF THE DPM REMOTE GEN PRECEDURE.
>;
>* Enter name of distribution kit device  [SY:] [S]: MS0:  ┐
>MOU MS0:/FOR                                              │
>* Enter name of source device  [SY:] [S]:                 │
>ASN SY:=SR:                                               │
>* Enter name of object/command device  [SY:] [S]:         │  ④
>ASN SY:=OJ:                                               │
>ASN SY:=CM:                                               │
>* Enter name of task image device  [SY:] [S]:             ┘
>ASN SY:=TS:
>UFD SR:[151,010]
>BRU/BACKUP:REMOTE/REWIND/NOINIT/NEW/DEN:1600 MS0:[151,010] SR:
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

>* Are you creating software for a mapped remote? [Y/N]: Y
>UFD OJ:[151,24]
>BRU/BACKUP:REMOTE/REWIND/NOINIT/NEW/DEN:1600 MS0:[151,024] OJ:[151,24]
```

① RSX-11S SYSGEN produces the system image file RSX11S.SYS in either [x,60] or [x,64]. This question asks for x.

② This question asks for the location of certain system files created by the RSX-11S system generation. For DPM, the default UIC [1,1] is usually correct, unless you have moved the files.

For DPM-PLUS, the default is never correct; before the remote build you must have transferred the files to another UIC on the library device, as explained in Section 5.3.

③ If you want to use a distribution kit already transferred to the system disk in a previous remote build, answer Y.

④ You identify the physical devices to associate with DPMRMT's logical device names. See Chapter 3. If you are using distribution software from a previous build, DPMRMT looks for source and object files on SR: and OJ:, respectively.

```
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

>UFD TS:[151,064]
>;
>* Do you want to generate assembly listings? [Y/N]: Y  ⑤
>* Enter listing output device  [SY:] [S]:
>ASN SY:=LI:
>* Do you want to generate cross-reference listings? [Y/N]:
>* Do you want to spool the generated listings? [Y/N]:
>* Do you want to purge object modules and assembly listings? [Y/N]:
>;
>;THIS COMMAND FILE WILL PRODUCE A SINGLE CONCATENATED OBJECT FILE FOR THE
>;DPM NETWORK ACP (DPM50R), AND ONE FOR THE STUB DRIVER (NIDRV).
>;YOU MAY WANT TO DELETE THE INDIVIDUAL OBJECT FILES USED TO PRODUCE THESE
>;IN ORDER TO SAVE SPACE ON SY:.
>;
>* Want to delete individual DPM50R object files? [Y/N]: Y
>;
>;THE DPM NETWORK'S REMOTE NODE GENERATION PROCEDURE MUST HAVE ACCESS TO
>;THE CONDITIONAL ASSEMBLY CONFIGURATION FILE THAT WAS PRODUCED BY THE RSX-11S
>;SYSTEM GENERATION PROCEDURE.
>;
>* IS DR1:[11,10]RSXMC.MAC your RSX-11S configuration file? [Y/N]:
>* Enter configuration file as DDU:[N,M]FILE.EXT [S]: SY:[3,64]RSXMC.MAC
>;                                                                          ⑥
>;The configuration file will now be checked for validity.
>;
>;DR1:[3,64]RSXMC.MAC;3 is correct for this gen.
>;
>;
>;THE ASSEMBLY FILES REQUIRED FOR THIS REMOTE GEN WILL NOW BE CREATED.
>;
>;
>* IS DR1:[003,64]RSX11S the name of your remote system image? [Y/N]: Y
>;
>* Do you want to generate the task build map(s)? [Y/N]: Y
>;
>* Enter map output device  [SY:] [S]:                              ⑤
>ASN SY:=MP:
>* Do you want to generate global cross reference listings? [Y/N]:
>* Do you want to spool the map files? [Y/N]:
>* Do you want to purge task images and map files? [Y/N]:
>;
```

⑤ Specify devices and options for maps and assembly listings, if desired.

⑥ DPMRMT locates and validates RSXMC.MAC.

```
>;
>* Do you want to add the DPM network FORTRAN routines to 11SLIB? [Y/N]: Y  ⑦
>* Do you want to edit any of the source or command files? [Y/N]:
>;
>;ALL ASSEMBLIES, TASKBUILDS, LIBRARY PROCEDURES, AND TASK FILE
>;TRANSFERS REQUIRED FOR THIS REMOTE GEN WILL NOW BE PERFORMED.
>;
>PIP SR:[151,10]S.MAC=DR1:[3,64]RSXMC.MAC;3,SR:[151,10]DPM50S.MAC
>PIP SR:[151,10]S.MAC/AP=SR:[150,10]PUSH.MAC
>PIP SR:[151,10]S.MAC/PU,DPM50S.MAC
>LBR LB:[3,64]EXEMC.MLB/RP=SR:[150,10]SBPREF.MAC/SZ
Module "SBERR$" replaced

Module "SBSCB$" replaced

Module "SBTBL$" replaced

Module "SBCW3$" replaced

Module "SBUCB$" replaced

>MAC @CM:[151,24]DPMRMTASM                                                    ⑧
>PIP OJ:[151,24]NIDRVREM.OBJ=OJ:[151,24]NIDEF.OBJ,NIDRV,NITAB
>PIP OJ:[151,24]DPM50R.OBJ=OJ:[151,24]NIDEF.OBJ,NIROOT,NICOM,NIOPN,NICON
>PIP OJ:[151,24]DPM50R.OBJ/AP=OJ:[151,24]NISND.OBJ,NIAST,DRINF
>PIP OJ:[151,24]DPM50R.OBJ/PU
>PIP OJ:[151,24]NIDEF.OBJ;*/DE,NIDRV.OBJ;*,NITAB.OBJ;*
>PIP OJ:[151,24]NIROOT.OBJ;*/DE,NICOM.OBJ;*,NIOPN.OBJ;*
>PIP OJ:[151,24]NICON.OBJ;*/DE,NISND.OBJ;*,NIAST.OBJ;*
>PIP OJ:[151,24]DRINF.OBJ;*/DE
>LBR LB:[3,64]RSXMAC.SML/RP=SR:[150,10]ISBMAC/SZ
Module "ISBIO$" replaced

>MAC OJ:[151,24]ISBSYM=SR:[150,10]ISBSYM
>LBR LB:[3,64]11SLIB.OLB/RP=OJ:[151,24]ISBSYM
Module "ISBSYM" replaced

>TKB @CM:[151,24]DPMRMTBLD.CMD
>LBR LB:[3,64]11SLIB.OLB/RP=OJ:[150,24]FORINT.OBJ
Module "FORINT" replaced

>BRU/BACKUP:REMOTE/REWIND/NOINIT/NEW/DEN:1600 MS0:[151,64]*.* TS:[151,064]  ⑨
BRU - Starting Tape 1 on MS0:

BRU - End of Tape 1 on MS0:

BRU - Completed

>PIP TS:[151,064]CNFIGR.TSK/PU
>SET /UIC=[1,24]
>ASN =SR:
>ASN =OJ:
>ASN =CM:
>ASN =TS:
>ASN =LI:
>ASN =MP:
>TIM
09:04:49 11-JUN-82
```

⑦ DPMRMT determines whether to update 11SLIB with DIS FORTRAN routines.

⑧ DPMRMT assembles and task-builds the DIS software.

⑨ DPMRMT transfers task images.

5.3.4 Procedures Following Remote Build

Task build your applications and place their task images in LB:[1,60] for an unmapped remote system or LB:[1,64] for a mapped remote system. Then run VMR to:

- Create the partitions
- Install and fix all tasks
- Load the drivers for SV: (DECdataway driver) and NI:

  (Network driver)
- Run the Network ACP (DPM50R) and any application tasks that must run at startup.

NOTE

Under DPM-PLUS, you must use the version of VMR supplied in the RSX-11S distribution kit.

The following is an example of a VMR command file for setting up a mapped remote DIS system:

```
RSX11S
SET /POOL=*
SET /MAIN=SYSPAR:*:37:TASK
SET /MAIN=GEN:*:*:SYS
LOAD SV:/PAR=GEN
LOAD NI:/PAR=GEN
LOAD TT:/PAR=GEN
INS TKN
FIX TKTN
INS BASMCR/PAR=GEN
FIX MCR...
INS DPM50R
FIX DPM50R
RUN DPM50R
SET /POOL
PAR
TAS
DEV
```

The command file above would work on files RSX11S.SYS and RSX11S.STB. Assuming the command file is named INS.VMR, it could be invoked as follows:

```
VMR>@INS.VMR
```

PART III
SYSTEM SET-UP

CHAPTER 6
SYSTEM FILE MANAGEMENT

Before you bring up a DPM/DPM-PLUS system for the first time, you should create certain files. Table 6-1 summarizes DPM/DPM-PLUS system files.

Table 6-1 DPM/DPM-PLUS System Files

LB:[1,2]DPMATT.ISB	
Used By:	ISBONL on systems with DPM01, VT110, or DYT01
Contents:	Terminal attributes
How Created:	ATGEN utility
FD:[152,10]FDMDSF.DAT	
Used By:	FDM Dispatcher
Contents:	Mapping of FDM terminal keys to task names
How Created:	Editor
LB:[1,2]RUNCLS.TXT	
Used By:	ATS Dispatcher
Contents:	Users' password, id, terminal class, uic, run class
How Created:	Editor
LB:[1,2]TRMCLS.TXT	
Used By:	ATS Dispatcher
Contents:	Terminal class definitions
How Created:	Editor

Table 6-1 (Cont.)

LB:[1,2]TASK.TXT	
Used By:	ATS Dispatcher
Contents:	Mapping of task names to run classes
How Created:	Editor
LB:[1,2]ATS.HLP	
Used By:	HELLO, when invoked by ATS Dispatcher for HELP feature
Contents:	HELP file text in standard RSX-11M-PLUS format
How Created:	Editor
LB:[1,2]DISBOO.DAT	
Used By:	DISBOO
Contents:	DLC, run, and abort commands to be executed when a DIS crashes
How Created:	Editor

6.1 TERMINAL INTERFACE ATTRIBUTE FILE

Figure 6-1 shows how the attribute file is generated by ATGEN and used by ISBONL to down-line load attributes to DYT01, or multiplexer ports.

6.1.1 Attribute Description

The utility, ATGEN, defines the following attributes for every DPM01, VT110, or DYT01 port:

Character length	5–8 bits
Number of stop bits	1–2
Input buffer length	1–133
Input terminating character No. 1	1–177 (octal)
Input terminating character No. 2	1–177 (octal)
Echo input characters	Yes,No
Treat terminal as CRT	Yes,No
Baud rate	50–9600
Recognize XON/XOFF	Yes,No
Parity	Odd,Even,None

6.1.1.1 CRT Attribute—Setting the CRT attribute has a number of implications. The DPM01, VT110, or DYT01 keeps a running history of the horizontal position of the cursor in the formatted write and formatted read modes. A DPM01 or VT110 assumes an 80-character display on a CRT and will generate a carriage return and line feed when the eighty-first character is entered. This is for display purposes only.

The DYT01 does not assume an 80-character display on CRT terminals; it will generate a carriage return only when a terminating character or RETURN is entered.

Characters on a previous line may not be deleted because the processing works only one line at a time. Within this constraint, CRT delete is fully supported for tab, line feed (no action), and the character set from 40 through 176 (octal). Tab stops are assumed at 8-character intervals. An attempt to tab to position 80 will result in an auto line feed for terminals connected to a DPM01/VT110 multiplexer, but not a DYT01.

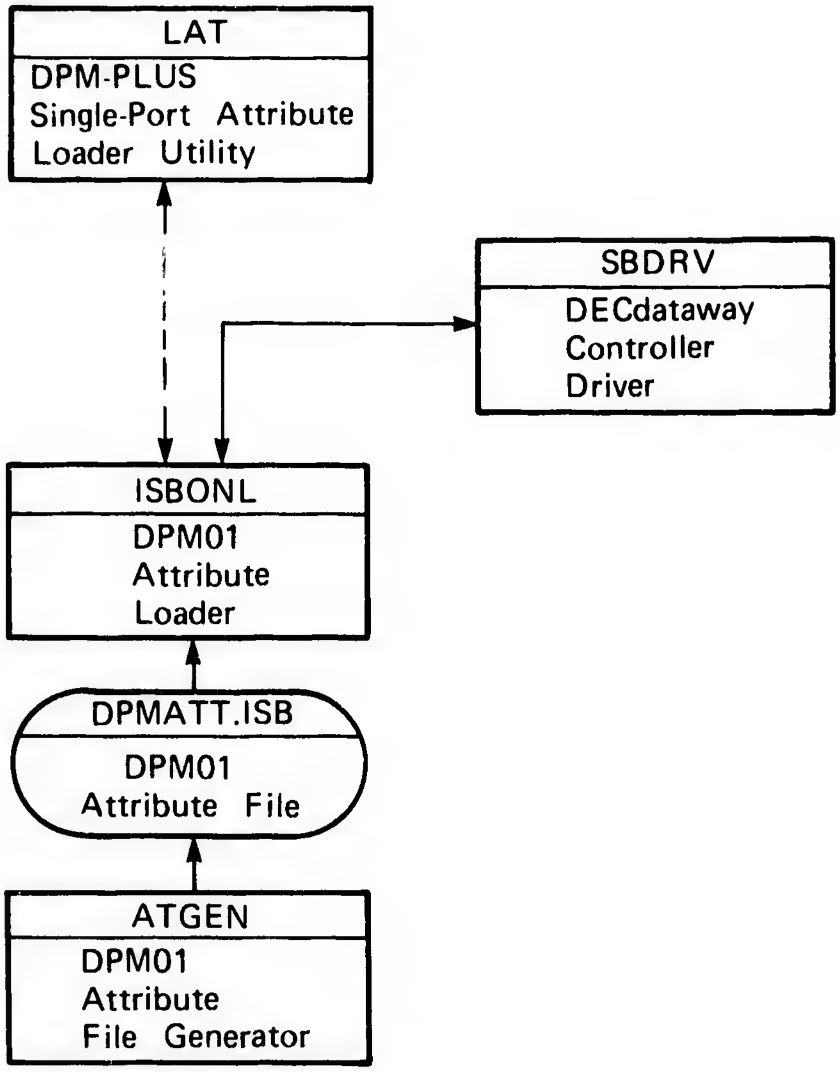


Figure 6-1 Attribute Loading

6.1.1.2 Delete Attribute—The DPM01, VT110, and DYT01 support the delete key in the formatted read mode. CRT delete is supported as described in Section 6.1.1.1; hard copy delete is supported by echoing back the character deleted from the input buffer. There is no maximum line size, and thus no auto line feed. Any character that is legal to read can be deleted. Attempts to delete back past the beginning of the input buffer or the start of the current line will ring the bell in the terminal. Because direct cursor control escape sequences are not standard throughout the industry, the DPM01, VT110, and DYT01 do not necessarily calculate the correct cursor position for these sequences. CRT delete of tab characters may not necessarily appear correct on the CRT with escape sequences in the write text string.

6.1.1.3 No Echo Attribute—The "no echo" attribute overrides any input command requesting echo.

6.1.1.4 XON/XOFF Recognition—XON and XOFF (CTRL/Q and CTRL/S) can be used to temporarily suspend and resume output to the terminal. This action occurs within one character time at any baud rate. Note that the DPM01, VT110, or DYT01 does not generate these commands; i.e., temporarily suspend input from a terminal.

6.1.2 ATGEN Functions

ATGEN is used to create, modify, or copy a file of attributes for down-line loading to DPM01, VT110, or DYT01 ports. This utility asks the user various questions about the desired attributes of a terminal and, from the response, fills in a buffer for that terminal. The attribute buffers for all possible terminals in a system are saved in a file LB:[1,2]DPMATT.ISB. This file is subsequently used to down-line load the attributes into the terminals. The following functions are supported:

• Initialize	Create and initialize a new version of the port attribute file.
• Modify	Show current attributes and allow them to be changed.
• List	Print a list of the attributes for any or all ports.
• Copy	Copy attributes from one port to another.

6.1.2.1 INITIALIZE Function—A new version of the port attribute file LB:[1,2]DPMATT.ISB is created and initialized for all possible 252 ports. The user is asked to confirm that he wishes to initialize; if so, he is prompted for each attribute in turn, starting with baud rate. The program will accept only legal attribute values.

6.1.2.2 MODIFY Function—The port attribute file LB:[1,2]DPMATT.ISB is modified. The user is asked for the controller number and port number of the port to be modified. The present attributes for the port are printed at the terminal and the user is prompted for each attribute.

6.1.2.3 LIST Function—The user can list the attributes for any port or number of ports. The user wishing to list the attributes of all ports should enter * (asterisk) when ATGEN prompts for controller. (To list attributes for all ports in one controller, enter * after the prompt for port number.) The port attribute file LB:[1,2]DPMATT.ISB is unchanged. The user is asked whether the listing is to be placed on the line printer. An affirmative response creates the file DPMATT.LST in the user's UFD and spools it to the line printer.

Otherwise, the listing is placed on the user's terminal. (It is the user's responsibility to purge his own directory of these DPMATT.LST files with PIP.)

6.1.2.4 COPY Function—This function defines the attributes of one port by copying them to another port. When COPY is specified, the user is prompted to input the controller number (or letter) and port number of the port whose attributes are to be copied. The user is then prompted to specify which port is to share the copied attributes.

6.1.3 How to Run ATGEN

If ATGEN is uninstalled, type RUN $ATGEN; if ATGEN is installed you can type just ATGEN. ATGEN begins by defining the options that you may select:

```
          I - INITIALIZE NEW FILE
          M- MODIFY EXISTING FILE
          C - COPY ATTRIBUTES TO ANOTHER PORT
          L - LIST OR EXAMINE FILE
     CTRL/Z - EXIT FROM ATGEN
```

After typing the letter for the appropriate option, you are given a prompt including possible responses. If you do not answer with one of these responses, the question is repeated.

Each ATGEN option asks for controller number, then port number. When a function completes, it recycles and asks for another controller/port number sequence. Responding to either query with RETURN terminates the function; you may then choose a new function or exit ATGEN.

The following baud rate values are legal:

50
75
110
134 (represents 134.5)
150
300
600
1200
1800
2000
2400
3600
4800
7200
9600

Buffer size should be specified in decimal, with a decimal point.

The only proper way to exit ATGEN is by typing CTRL/Z, when asked to choose a function. Any other method of exiting ATGEN creates an unusable copy of DPMATT.ISB.

6.1.3.1 Default Values

6.1.3.1 Default Values—If certain questions are answered with a carriage return, the default value given in square brackets ([]) will be taken. A list of default values appears below:

- No parity
- Character length of 8 bits
- 1 stop bit
- Terminal device a CRT
- Input characters echoed
- First termination character, RETURN
- Second termination character, CTRL/Z
- Buffer size 133 (decimal) characters

6.1.4 Recommended Attributes

The attributes listed in Table 6-2 are intended as an aid in getting started with the listed devices. The attributes eventually chosen must be determined by the configuration of the device, as well as by the nature of the application tasks which use the device. For all devices, the recommended initial choice for buffer size and termination characters should be the ATGEN default values.

Table 6-2 Recommended Attributes

Device Attached	Baud Rate	Stop Bits	Character Length	Parity	Priority Device	CRT
LA36	300	1	8	N	N	N
LA180	9600	1	8	N	Y	N
VT52	2400	1	8	N	N	Y
VT55	2400	1	8	N	N	Y
VT100	2400	1	8	N	Y	Y

6.1.5 ATGEN Error Messages

FILE CONTROL SERVICE ERROR
FCS ERROR CODE = xxx

> See Appendix I in the *IAS/RSX-11 I/O Operations Reference Manual* for a description of the error corresponding to the error code.

CAN'T CLOSE, DELETE ATTRIBUTE FILE AFTER FAULTY WRITE

> When an FCS error occurs, an attempt will be made to close and delete the attribute file (LB:[1,2]DPMATT.ISB). This attempt was unsuccessful. The user should delete the old attribute file and create a new one using INITIALIZE. Should this error persist, call Field Service (you probably have a hardware problem).

ATTRIBUTE FILE CLOSED, DELETED AFTER FAULTY WRITE

When an FCS error occurs, the attribute file will be closed and deleted. You must reenter ATGEN and INITIALIZE to create a new attribute file.

PORT CURRENTLY HAS NO ATTRIBUTES

When you try to MODIFY a port with no attributes, you receive this warning, followed by the prompts for attributes, starting with baud rate. You must input attributes to remain in the ATGEN program; CTRL/Z and RETURN are ignored.

SOURCE PORT HAS NO ATTRIBUTES, CANNOT COPY

You have attempted to copy from a port without attributes. Either you have specified the port number incorrectly and should try again, or you may have to use MODIFY to create attributes for the new port.

DESTINATION PORT IS SOURCE PORT, CANNOT COPY

You have specified the same port as both source and destination port in a COPY operation.

6.2 FDM DISPATCH FILE

The default name of the Dispatch File is FD:[152,10]FDMDSF.DAT. It is a sequentially-accessed set of up to 32,767 variable-length records (80 characters maximum). The interpretation of these records is specified on subsequent pages. Each record normally associates a specific transaction key, or transaction index from a specific terminal with a specific user task (although the mapping will commonly be many-to-one). A typical instance of this file might be as follows:

```
SB1:    KEY=A   POLICE    ;   GUARD SHACK,   KEY  1  ALERTS  TOWN
                                             POLICE
SB1:    KEY=B   FIRE      ;   GUARD SHACK,   KEY 2 CALLS FIRE DEPT.
SB1:    KEY=C   PROPAS    ;   GUARD SHACK,   KEY  3  CHECKS  PROPERTY
                                             PASSES
SB1:    KEY=D   TEMPOR    ;   GUARD SHACK,   KEY  4  LOGS  TEMPORARY
                                             WORKERS
SB1:    KEY=E   NIGHT     ;   GUARD SHACK,   KEY  5  TURNS  ON  STREET
                                             LIGHTS
SB1:    KEY=F   DAY       ;   GUARD SHACK,   KEY 6 TURNS OFF STREET
                                             LIGHTS
SB1:    KEY=*   WSDEMO    ;   GUARD SHACK,   OTHER    KEYS    TEST
                                             TERMINAL
;
SB77:   KEY=A   TOTALS    ;   PLANT MGR, KEY 1 GIVES PRODUCTION
                              TOTALS
SB77:   KEY=B   MANPWR    ;   PLANT  MGR,  KEY  2  SHOWS  MANPOWER
                              CHARGES
SB77:   KEY=C   NIGHT     ;   PLANT  MGR,  KEY  3  TURNS  ON  STREET
                              LIGHTS
SB77:   KEY=D   DAY       ;   PLANT  MGR,  KEY  4  TURNS  OFF  STREET
                              LIGHTS
SB77:   KEY=*   WSDEMO    ;   PLANT MGR, OTHER KEYS TEST TERMINAL
;
SB41:   IDX=01  TOTALS    ;   ACCOUNTING, GIVES PRODUCTION TOTALS
SB41:   IDX=02  INVOIC    ;   ACCOUNTING, PRODUCES INVOICES
;
SB42:   IDX=01  JOBSTA    ;   ORDER ENTRY, REPORTS OF JOB STATUS
;
SB*     KEY=I   UPDATE    ;   ANY RT803, UPDATE PRODUCTION DATA
;
SB*     KEY=J   OVERTI    ;   SUPERVISORY   KEY   ALLOWS   OVERTIME
                              LOG-OUT
;
SB*     IDX=99  WEATHR    ;   ANY  DPM0  1/VT110  TERMINAL,  GIVE
                              WEATHER FORECAST
SB*     IDX=66  FDMDST    ;   ANY DPM01/VT110 TERMINAL, DISPATCHER
                              TESTER
SB*     KEY=H   FDMDST    ;   ANY RT805, KEY 8, DISPATCHER TESTER
SB*     IDX=**  TREK      ;   ANY   DPM01/VT110   TERMINAL,   RUN
                              STAR-TREK GAME
;
SB88.:  KEY= *  DEVELO    ;   DEVELOPMENT TERMINAL FOR PROGRAMMER
SB*     KEY=*   FDMCAT    ;   ANY RT8XX TERMINAL, DISPATCHER CATCHER
;
//      NOW LIST ALL TERMINALS, NOT EXPLICITY LISTED ABOVE, TO BE
                                                          USED.
;
SB3:                      ;   THESE RECORDS ARE IGNORED BY FDMDIS,
SB7:                      ;   BUT ARE USED BY FDMDSD IN STARTING
SB10:                     ;   THE DISPATCHER (FDD BEGIN) TO COMMAND
SB11:                     ;   FDMDSX TO USE THESE TERMINALS.
SB64.:
SB65.:
;
;       END OF TERMINAL LIST.
```

Records in the Dispatch File which begin with a semi-colon (;) or with an exclamation point (!) are treated as comments and ignored. Records in the Dispatch File, which begin with "SB", are data records. A record which begins with a slash (/) marks the end of the explicit data records; FDMDIS will stop searching the Dispatch File at this point, and FDD will stop validating records. Terminals which are listed after this point will be started by FDD during a BEGIN operation.

The use of these implicit data records is illustrated on the previous page. Records which are neither comment records nor data records, and which do not begin with a slash, are invalid.

Each data record contains three data items: a terminal name, a transaction key or index, and a task name. These data records are examined by two tasks, FDD and FDMDIS. When the user types FDD BEGIN, FDD reads the Dispatch File to determine which terminals to use; FDD also checks the data records for validity. When a transaction is initiated through the dispatcher, FDMDIS reads the Dispatch File to determine which task to request.

Both FDD and FDMDIS scan data records from left to right, expecting to find terminal name, key or index, and task name in that order. Both begin scanning for a valid transaction key or index item in the column to the right of a valid terminal name; a separator is not strictly necessary. Both begin scanning for a valid task name in the column to the right of a valid transaction key or index; a non-alphabetic character must immediately precede the task name. A valid terminal name has one of the three forms below:

SBnnn:	nnn is the octal device number
SBddd.:	ddd is the decimal device number
SB*	* identifies a wild-card entry

A valid transaction key item consists of an equal sign, followed by a single alphabetic character in the range of A–J or a *. The * identifies a wild-card entry; A–J correspond to the codes for the transaction keys on RT80x terminals.

A valid transaction index item consists of an equal sign, followed by a two-digit number in the range of 01–99 or a **. The ** identifies a wild-card entry; 01–99 corresponds to the valid range of the transaction index which may be entered from a terminal connected to a DPM01, VT110, or DYT01.

A valid task name is 1–6 alphanumeric characters, of which the first character must be alphabetic. Note that these tasks must be installed in order to be invoked through the dispatcher.

It is recommended that records be inserted in the Dispatch File in descending order of frequency of terminal usage. Since the file is searched sequentially, proper ordering will decrease search time.

A wild-card specifier in the terminal name field indicates to FDMDIS that this record applies to any terminal. A wild-card specifier in the transaction key/index field indicates to FDMDIS that this record applies to any key/index from this terminal. A record may contain wild-card specifiers in both the terminal name and transaction key/index fields, which indicates to FDMDIS that this record applies to all transaction keys or transaction indices from all terminals. Note that a record applies to either RT80x terminals, or to terminals connected via a DPM01, VT110, or DYT01, but not to both. Transaction keys are always one character, and transaction indices are always two characters.

NOTE

Some dispatch records, called fast-access records, may be built into FDMDIS itself, instead of included in the Dispatch File (see Chapter 4). However, all devices named in fast-access records must also be named in the Dispatch File.

6.3 ATS DISPATCHER ACCESS CONTROL FILES

The ATS Dispatcher requires that you create several control files for implementing system and task protection for your installation. The specific files required and their contents depend on the particular forms of access control you selected during the DPM host generation procedure.

If you chose to allow any user to run tasks, but only from a predefined set of tasks (Limited Task Protection), you must create a Task Control File.

If you chose to require users to log in to the ATS Dispatcher (Login Protection), you must create a Task Control File and a Run Class File.

If you chose to limit which users and/or tasks may use specific terminals (Terminal-Based Protection), you must create a Task Control File, Run Class File, and Terminal Class File.

Use a text editor to create the necessary files in the formats specified in the next three sections. Within a file line, items must be separated by one or more tab or space characters. Lines may not exceed 132 characters.

6.3.1 Task Control File

Each entry in the Task Control File LB: [1,2]TASK.TXT contains the name of a task that may be run from DSP-connected terminals. If either Login or Terminal-Based Protection was selected, the entry also lists the Run Classes which are allowed to run the task. The syntax is:

```
tsknam [list]
```

where:

tsknam	is the name of the task. See the *DPM/DPM-PLUS Terminal User's Guide* for conventions and restrictions on task names.
list	is either the set of the Run Classes allowed to run the task or an asterisk to indicate that all Run Classes may run the task. A list is required if Login or Terminal-Based Protection was selected and is ignored otherwise. The list consists of Run Class numbers separated by a tab or space. (A Run Class number is the numeric part of a Run Class Identifier; see Section 6.3.2.) If all the Run Class numbers do not fit on a single 132-character line, create an additional entry on the following line containing the same task name and the remainder of the list.

Example:

```
INTRO        1     2    15
INVENTORY    *
ENTRIES      4    12    14    18    29    37
ENTRIES     17     2
CREA         *
```

6.3.2 Run Class File

You must create the Run Class File LB:[1,2]RUNCLS.TXT if you chose to require users to log in to the system (Login Protection or Terminal-Based Protection). The Run Class File contains a User Descriptor for each individual who may use the system. User Descriptors are grouped into Run Classes within the file. The Run Class to which the User Descriptor is assigned controls which tasks the user may run.

Each User Descriptor contains a Login Code consisting of a user identification and password. In order to log in, a user must supply a valid Login Code.

If Terminal-Based Protection was chosen, the User Descriptor also contains a Terminal Class Identifier which specifies the group of terminals for which the Login Code is valid.

There are two types of entries in the file:

1. Run Class Identifier

   This entry identifies the Run Class to which the next group of User Descriptors is assigned. The syntax is:

   ```
   #n
   ```

   where:

   n — is a decimal number (1–255) identifying a Run Class.

2. User Descriptor

   This entry identifies a Login Code and associates it with a default UIC. If Terminal-Based Protection is chosen it also identifies the set of terminals for which the Login Code is valid. A user supplying this Login Code (at a terminal for which it is valid) will be assigned to the Run Class specified by the previous Run Class Identifier entry. The syntax is:

   ```
   userid    password    uic    [tclass]
   ```

   where:

userid	is a user identification of 1 to 10 characters. This userid together with a password constitute a Login Code. passwrd is the user's password of 1 to 6 characters.
uic	is the default identification code to be used for any task run by the user. It is entered in standard Files-11 format: [x,y] where x is a group code (1–377) and y is a member code (1–377).
tclass	is the number of the Terminal Class for which the Login Code is valid. It must be supplied if Terminal-Based Protection was chosen. Terminal class is a decimal number (1–255). Alternatively, an asterisk signifies that the Login Code is valid for all terminals.

Example:

```
#1

BAZ            BAZ         [7,200]       1
JOHN           MDC         [100,200]     1

#2

EINSTEIN       TREBLA      [1,100]       *
CONNEL         JXRVS       [5,77]        2

#3

WILLIE         SHOE        [72,73]       3
```

6.3.3 Terminal Class File

You must create the Terminal Class File LB:[1,2]TRMCLS.TXT if Terminal-Based Protection was chosen for the ATS Dispatcher. The file establishes groups of terminals called Terminal Classes. Any Login Code which is valid for one terminal in a Terminal Class is valid for any terminal in the Terminal Class. Users' access rights to tasks are unaffected by which terminal within a Terminal Class they use.

There are two types of entries in the file:

1. Terminal Class Identifier

   This entry identifies the Terminal Class to which the next group of Terminal Descriptors are assigned. The syntax is:

   ```
   #n
   ```

   where:

n	is a decimal number (1–255) identifying a Terminal Class.

2. Terminal Descriptor

   This entry lists terminals belonging to the previous Terminal Class identified in the file. You may use several Terminal Descriptors to list all the terminals. The syntax is:

   ```
   dd: list
   ```

   where:

dd:	is SB: for DPM01, VT110, or DYT01 terminals, TT: for local terminals
list	is a set of unit numbers of the terminals, separated by one or more tab or space characters.

Example:

```
 #5

 SB:        1      2      4
 TT:        4      5      6
 SB:        7     10     11     12

 #2

 SB:        2      6     15
 TT:       12     13     14
```

6.4 ATS DISPATCHER HELP FILES

The ATS Dispatcher supports HELP files. If a DPM01, VT110, or DYT01 terminal is connected to the dispatcher, a user may type:

```
HELP keywords
```

The ATS Dispatcher then invokes the HELLO task, which extracts from a HELP file the text corresponding to the keywords, and displays the text at the ATS terminal.

When invoked by the ATS Dispatcher, HELLO searches the file LB:[1,2]ATS.HLP. That is, typing:

```
HELP keywords
```

at an ATS terminal is equivalent to typing:

```
HELP/CLI:ATS keywords
```

at an MCR terminal.

To take advantage of the ATS Dispatcher's HELP feature, you must create the file LB:[1,2]ATS.HLP. Please see the *RSX-11M-PLUS Command Language Manual* for details of how to set up a HELP file.

6.5 DISBOO AUTOMATIC REBOOT COMMAND FILE

DISBOO is a DPM host task for automatically rebooting DIS systems. DISBOO executes commands from the portion of its command file pertaining to the remote which requires rebooting.

You must create the command file LB0:[1,2]DISBOO.DAT. The file contains four types of entries:

1. DIS ID line	This line identifies a DIS. The command lines for that DIS must be grouped together, following the ID line. If the channel to that DIS breaks, DISBOO will execute the associated commands.
2. Command lines	These lines each contain one command to DISBOO. All the command lines pertaining to one DIS must follow each other in the file. DISBOO commands, described below, are DLC, RUN, and ABO.

3. Terminator line	A terminator line contains only a slash (/) in the first character position. One terminator line must follow the last command line of the group for each DIS.
4. Comment line	DISBOO ignores comment lines. A comment line contains a semicolon in the first character position. It may contain any other characters. Comment lines may appear anywhere in the command file.

The DIS ID line is as follows:

Character Position	**Contents**
1–3	DECdataway unit number (octal) of the DIS base port (This number was the argument to the DLC/BO: switch when the DIS was originally booted.)
4	Space or tab
5–10	Remote node name (This name was the argument to the DLC/NO: switch when the DIS was originally booted.)

The command line is as follows:

Character Position	**Contents**
1–3	Command -=-= DLC—causes DLC to run and execute the command specified in the argument field (positions 5-80). ABO—aborts the host task specified in the argument field. RUN—runs the host task specified in the argument field.
4	Space or tab
5–80	Argument -=-= For DLC, a DLC Boot (/BO:) command for the DIS. Chapter 6 of the *DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide* describes DLC. For ABO and RUN, the name of an installed task in the host.

Example of DISBOO.DAT file:

```
;       For the DIS in the tank farm:
;
007 TANK
DLC LB:[300,300]LITTLE.SYS/BO:7/NO:TANK/TM:30.
/
;       For the DIS on the North tower:
;
005 NORTH
DLC LB:[222,222]BIG.SYS/BO:5/NO:NORTH/TM:15.
RUN INITNO
/
;       For the DIS on the South tower:
;
003 SOUTH
DLC LB:[222,222]BIG.SYS/BO:3/NO:SOUTH/TM:15.
RUN INITSO
/
;       If the DIS in the lab was running wet tests:
;
012 WETLAB
ABO WETLOG
DLC DK1:[2,64]WET/BO:12/NO:WETLAB/TM:30.
RUN WETLOG
/
;       If the DIS in the lab was running dry tests:
;
012 DRY LAB
ABO DRYLOG
DLC DK1:[3,64]DRY/BO:12/NO:DRYLAB/TM:30.
RUN BEGDRY
RUN DRYLOG
/
;       For the DIS in the VIP conference room:
;
001 VIP
ABO REPORT
DLC LB: [1,64]SHOW/BO:1/NO:VIP/TM:5.
RUN SORRY
RUN REPORT
/
```

CHAPTER 7
DPM/DPM-PLUS STARTUP

This chapter describes what happens when a DPM/DPM-PLUS system starts up. Some steps require you to issue MCR commands to initialize the DPM software. The commands are usually issued in an indirect command file.

The standard host build procedure generates a model startup command file, based on the configuration you select. You should adapt the model file to your system. Then you can invoke the DPM startup command file from the operating system startup command file [1,2]STARTUP.CMD. Section 7.2 describes a sample DPM startup command file.

7.1 DPM/DPM-PLUS STARTUP SCENARIO

7.1.1 Host and DECdataway Software Startup

- Host RSX-11M or RSX-11M-PLUS operating system starts.
- RSX-11M/RSX-11M-PLUS startup command file begins executing. You enter the time of day.
- Startup file issues MCR commands to install DECdataway software.
- Startup file issues command to load the DECdataway controller driver (SBDRV).
- Startup file issues command to run FDCTIM every 10 seconds.
- DECdataway controller driver runs the DECdataway controller initializer (ISBINI), which was previously installed.
- ISBINI initializes the ISB11 DECdataway controllers, as follows:
    - Tests the ISB11 control RAM
    - Loads and executes the confidence test (file SBCNCK) in the control RAM
    - Loads and initiates the controller microcode (file ISB11)
    - Sets configuration parameters for microcode
- Controllers begin polling.
- When the controller detects the presence of a device on the DECdataway, it notifies the DECdataway controller driver. The driver invokes the event logger (ISBERR), which records the on-line transition.

- Startup file invokes CBC to set up port device assignments.
- Startup file invokes LAT to load attributes for DYT01, DPM01 and VT110 ports.
- Startup file invokes SBTACP for DPM-PLUS only.

7.1.2 DPM01, VT110, or DYT01 Startup

- DPM01, VT110, or DYT01 powers up.
- Onboard microcode runs self-test procedure. When the test succeeds, the device responds to polling and its presence is detected by the DECdataway controller.
- The DECdataway controller driver runs the task ISBONL, if the port has been configured as a DYT01, VT110, or a DPM01. Attributes are stored in the host file LB:[1,2]DPMATT.ISB. You create the attribute file using the program ATGEN.

7.1.3 RT80x Startup

- Terminal powers up.
- Onboard microcode runs self-test procedure. When the test succeeds, the device responds to polling and its presence is detected by the DECdataway controller.
- FDCTIM uses the broadcast channel (port 0 of each DECdataway controller) to send the time. RT801, RT803, and RT805 terminals monitor the broadcast channel and display the time of day.

7.1.4 DIS Startup

- DPM50 or DPM23 powers up.
- The remote DECdataway interface (ISV11) runs diagnostics which test both the ISV11 and the LSI-11. The ISV11 LEDs display a rotating pattern when the microcode is executing.
- Startup command file loads the host network driver (N1DRV), installs the host network ACP (DPM50H), and installs the down-line load and control task (DLC).
- DLC is run to down-line load the remote.
- DLC verifies that:
    - The file specified in the command is a system image.
    - The DIS's DECdataway address specified in the command is valid.
    - The node name specified in the command is unique.
- DLC halts the remote processor and loads the specified system image file into the remote memory.

- DLC reads the contents of remote memory back upline to the host and compares the memory contents to the system image file.
- DLC starts the remote processor at the transfer address specified in the system image file.
- Host and remote ACPs open a communications channel between them, as follows:
    - Remote ACP sends initialization request to host ACP.
    - Host ACP recognizes successful boot of remote, and sends the DIS a message containing the remote node name, time, and date.
    - Host ACP notifies DLC of successful completion.

7.2 DPM/DPM-PLUS STARTUP COMMAND FILE

Figure 7-1 shows a DPM/DPM-PLUS startup command file. Annotated comments follow.

NOTE:

YOU MAY NOT USE VMR TO LOAD SB: DRIVER. YOU MUST USE THE STARTUP COMMAND FILE AS SHOWN HERE, OR INPUT COMMANDS THROUGH MCR.

```
;          FILENAME  - STARTUP.XMP
;
.ENABLE SUBSTITUTION
.ASKS NOW ENTER TIME (HH:MM: DA-MON-YR)
TIM 'NOW'                       !IT IS ADVANTAGEOUS TO SET THE      ①
TIM                             !CORRECT TIME BEFORE RUNNING DLC
                                !OR FDCTIM.
;
;          INITIALIZE DECDATAWAY SOFTWARE
;
INS $ISBINI                     !INSTALL INITIATOR TASK
INS $ISBERR                     !INSTALL EVENT LOGGING TASK         ②
INS $ISBRPT                     !INSTALL EVENT REPORTING TASK
INS $CBC                        !INSTALL CONFIGURATION TASK
;
;       DPM01/VT110 SPECIFIC COMMANDS
;
INS $ISBONL                     !INSTALL DPM01/VT110 ONLINE TASK    ③
;
;       LOAD THE DECDATAWAY DRIVER
;
.SETS ISBPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR
;                               !SYSTEM                             ④
;
LOAD SB:/PAR='ISBPAR'           !LOAD DECDATAWAY DRIVER
;
;       CONFIGURE THE DATAWAY                                       ⑤
;
CBC @LB:[1,24]CBC
;
;       LOAD ATTRIBUTES FOR THE TERMINAL DEVICES
;
.IFNINS LAT INS $LAT
;
LAT @LB:[1,24]LAT
;
;       DIS SPECIFIC COMMANDS                                       ⑥
;
.SETS ACPPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR
;                               !SYSTEM
.SETS NIDPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR
;                               !SYSTEM
;
INS $DPM50H/PAR='ACPPAR'        !INSTALL THE HOST NETWORK ACP
LOAD NI:/PAR='NIDPAR'           !LOAD THE NETWORK DRIVER
INS $DLC                        !INSTALL THE DOWNLINE LOAD TASK
INS $DISBOO                     !INSTALL THE AUTO-REBOOT TASK
DLC [1,60]RSX11S/BO:1/NO:FRED   !DOWNLINE LOAD THE DIS AT SB1,
;                               !SB2.  CALL IT FRED.                ⑦
;
;       INSTALL AND RUN THE TERMINAL ACP
;
```

Figure 7-1 Startup Command File

① The time sent to RT80x terminals and the time initialized when DIS systems start is based on the time you enter here.

② The DECdataway tasks must be installed. You may want to install DPM utility tasks also.

③ Install ISBONL.

④ If you did not build host software for the default GEN partition, specify actual partition names in the startup file (substituting for the quoted names in the model file).

⑤ Run CBC command file to assign DECdataway addresses.

⑥ Run LAT command file to load attributes for all DPM01, DYT01 or VT110's.

⑦ Include a DLC command for every DIS you want to down-line load. The *DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide* contains complete instructions for DLC.

```
.SETS TACPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR
;                               !SYSTEM
;
INS $SBTACP/PAR='TACPAR'/HIGH   !INSTALL THE TERMINAL ACP HIGH    ⑧
;                               !IN MEMORY
RUN SBTACP                      !NOW RUN THE TERMINAL ACP
;
; INSTALL THE DISPATCHER (DSP) AND PROTECTION (DSPPRT) TASKS
;
.SETS DSPPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR
;                               !SYSTEM
.SETS PRTPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR      ⑨
;                               !SYSTEM
;
INS $DSP/PAR='DSPPAR'           !INSTALL THE DISPATCHER
INS $DSPPRT/PAR='PRTPAR'        !INSTALL THE PROTECTION TASK
;
;       INSTALL AND RUN THE CONNECT/DISCONNECT UTILITY (CDU)
;
.SETS CDUPAR "GEN"              !SUBSTITUTE THE PAR FOR YOUR
;                               !SYSTEM
;
INS $CDU/PAR='CDUPAR'           !INSTALL CDU
CDU SB1/CO                      !CONNECT SB 1
CDU SB2/CO                      !CONNECT SB 2
;
;       RUN CONFIG
;
CON ONLINE ALL                  !BRING ALL DEVICES ONLINE
;
;       RUN AND SCHEDULE FDCTIM TASK
;
INS $FDCTIM                     !INSTALL TIME ANNOUNCER TASK,
FIX FDCTIM                      !FIX IT IN MEMORY, AND
RUN FDCTIM M/RSI=10S            !SCHEDULE IT TO RUN EVERY TEN     ⑩
;                               !SECONDS.
```

Figure 7-1 Startup Command File (Cont.)

⑧ You must explicitly Dismount particular DPM01, VT110, or DYT01 terminals from the ACP if:

- Tasks directly encode PCBs in their terminal I/O requests

AND

- The QIO functions are Read and Write Logical Block or Read and Write Virtual Block (not Read and Write with Peripheral Control). See the *DPM/DPM-PLUS Terminal User's Guide.*

Dismount the terminals as follows:

```
>DMO SBxx:/DEV
```

⑨ DPM-PLUS only.

⑩ SBDRV recovers from certain DECdataway controller errors using logic that depends on periodic transmissions over the broadcast channel. Therefore, even if your configuration has no RT80x terminals, ALWAYS INSTALL, FIX, AND RUN THE TIME ANNOUNCER TASK FDCTIM.

CHAPTER 8
SYSTEM VERIFICATION

DPM/DPM-PLUS systems include the following verification tasks:

• WSDEMO	Verifies and demonstrates RT805 and RT803 terminals.
• FDMTST	Tests RT80x terminals and terminals connected to a DPM01, VT110, or DYT01.
• DPMTST	Verifies and demonstrates terminals connected to a DPM01, VT110, or DYT01.
• CNFIGH/CNFIGR	Verify host and remote build procedures and also verify a DIS's I/O device configuration.

8.1 WSDEMO

A Work Station Demonstration task (WSDEMO) is supplied with each DPM system. This task facilitates on-line trouble-shooting and verification of RT803 and RT805 terminals; it permits complete end-to-end (terminal-to-host and host-to-terminal) validation of data. WSDEMO is not useful for any other DECdataway devices.

WSDEMO can help the new user become familiar with RT80x terminals.

WSDEMO is a multi-threaded task which uses FDMUTR to demonstrate the features of up to ten RT803 and RT805 terminals. WSDEMO supports T3 and T5 readers, as well as keypad-display inputs.

WSDEMO may be invoked through a MCR terminal or through the FDM Dispatcher. When invoked from a MCR terminal (by typing RUN WSDEMO), it will ask the operator for the device number(s) of up to ten RT803 and RT805 terminals to be used. When invoked from a RT803 or RT805 terminal through the dispatcher, terminal usage will not commence for five seconds, to allow WSDEMO to be invoked from other terminals. Once invoked, WSDEMO runs a batch of up to ten terminals concurrently until the demonstration has been CANCELed at all involved RT80x terminals.

WSDEMO begins using an RT80x terminal by asking its operator to select a transaction (by pushing a transaction key on an RT805, or by keypad entry on an RT803). Once selected, a transaction remains in effect until CANCELed; the transaction is continued by entering media. The nine transactions are as follows:

Transaction 1 reads a 22-column stub card or ticket, and displays what was read on the 32-character alphanumeric display until the operator pushes CANCEL or enters another ticket. CANCEL exits from this transaction and allows selection of another transaction. If another ticket is inserted, it will be read and displayed on the alphanumeric display.

Transaction 2 reads a 22-column badge, and displays what was read until the operator pushes CANCEL or inserts another badge.

Transaction 3 reads an 80-column Hollerith card, and displays the first 32 columns read until the operator pushes CANCEL or inserts another card.

Transaction 4 reads an 80-column Hollerith card, and displays columns 1-14 and columns 67-80 until the operator pushes CANCEL or inserts another card.

Transaction 5 reads a 10-column badge (without local prompting), and displays what was read until the operator pushes CANCEL or inserts another badge. This transaction cannot be selected on an RT803.

Transaction 6 reads a 10-column badge (with local prompting), and displays what was read until the operator pushes CANCEL or inserts another badge. This transaction cannot be selected on an RT803.

Transaction 7 accepts keypad data (in query format), and displays what was read until the operator pushes SEND or CANCEL.

Transaction 8 accepts keypad data (in fill-in-the-question-marks format), and displays what was read until the operator pushes SEND or CANCEL.

Transaction 9, selected by turning the terminal keyswitch to the Supervisory position, displays a fixed message until the operator returns the terminal keyswitch to the Normal position and selects another transaction.

8.2 FDMTST

FDMTST, the FDM Terminal Tester Task, supplies an on-line tool for an operator to exercise and test all features of RT80x terminals as well as conventional terminals connected to DPM01 or VT110 multiplexers or to a DYT01. FDMTST interpretively responds to commands, entered from the initiating (MCR) terminal to perform such basic functions as:

- Write a message to the terminal
- Read a message from the terminal
- Exercise the display on the terminal
- Test digital I/O on an RT805 terminal

FDMTST begins by asking the operator at the MCR terminal which controller and which port to use; FDMTST normally runs until ended by input of CTRL/Z by the operator. When the operator selects a controller and a port, FDMTST connects to that terminal and reports back to the operator the type of terminal which has been selected and (for DPM01 or VT110 multiplexers, and the DYT01) the attributes which have been down-line loaded into that port.

FDMTST accepts and executes the following commands:

```
WRIT sf t s
WRITE sf t s
WRITV sf t s
READ sf t s
PRRD sf t s
MSG=message...
MSG(nnn)=more.message...
MSG(nnn)=X
MSG(nnn)"ooo"
MSGS=ooo-ppp
DIG
ROSC nn
CLOCK
SHOW fl
REPEAT=nnnnnnnn
TSTCAN
PRINTER
CHANGE (not supported under DPM-PLUS)
SEL=ooo, and SEL=ddd.
SEL=+, and SEL=-
```

WRIT causes FDMTST to write a previously entered MSG to the selected DPM terminal; sf may be any sub-function (WRCODE) which is valid for that terminal; t is an optional designator for TRANLT (in the range of "@" through "J"); s is an optional designator for STATUS (in the range of "@" through "O"). WRIT will cause FDMTST to write the message, wait for completion, report the result (if bad), and then prompt for another command.

WRITE is identical to WRIT; it is merely an alternative spelling.

WRITV means WRITe Variable length. When used in conjunction with a REPEAT count, WRITV first writes the complete previously entered MSG (n characters), then writes the first n-1 characters of MSG, then writes the first n-2 characters of MSG, and so on.

READ causes FDMTST to read from the selected DPM terminal and then display what was read on the input terminal; sf may be any sub-function (RDCODE) which is valid for that terminal; t and s are optional designators, as in WRIT.

PRRD causes FDMTST to prompt the selected DPM terminal with a previously entered MSG, read from that terminal, and then display what was read on the input terminal; sf may be any sub-function (PRCODE) which is valid for that terminal; t and s are optional designators, as in WRIT.

MSG=message... is a command for entering a message—up to 76 (decimal) characters—for subsequent WRIT's and PRRD's.

MSG(nnn)=more.message... is a command for adding to an existing message, primarily to make it longer; nnn identifies the (decimal) column at which more.message is to begin. Entering MSG=12345, then MSG(005)=678, results in a message of 1234678.

MSG(nnn)=x is a command for replacing one character of an existing message. Entering MSG=12345, then MSG(003)=A, results in a message of 12A45.

MSG(nnn)"ooo" is a command for replacing one character of an existing message with another byte whose octal code is ooo.

Entering MSG=XHELLO, then MSG(001)"000," results in a 6-byte message consisting of a null byte followed by HELLO. Entering MSG=1234567890ABCDEF, then MSG(012)"177," replaces the B in the message with a delete character.

MSGS=ooo-ppp is a command to enter a message string consisting of the characters from ooo through ppp (octal). Entering MSGS=040-132 results in a 59-byte message beginning with a space and ending with a Z. MSGS=101-115 is equivalent to MSG=ABCDEFGHIJKLM.

DIG causes FDMTST to copy the RT805 terminal's digital inputs to its display, and to copy the most significant byte of input to its digital output module. DIG is only appropriate for an RT805 with a digital I/O module installed.

ROSC nn causes the RT80x terminal's relay to oscillate nn times (0<nn<100.). ROSC is not applicable for the DPM01, VT110, or DYT01.

CLOCK displays date and time (plus the repeat count) on the DPM terminal's display. On RT805 and RT803 terminals for one second out of each minute, CLOCK sequentially: sounds the alarm and lights ERROR; lights each of the eight RT805 transaction lights, or lights the RT803 transaction light; and lights ENTRY ACCEPT.

SHOW fl sequentially displays rows of data, defined by fl; for example, "SHOW AC" will display a line of 32 As, then a line of 32 Bs, then a line of 32 Cs. If the selected terminal is a connected to a DPM01, VT110, or DYT01, the line size is 72 characters.

REPEAT=nnnnnnnnn permits entry of a repeat count before entering one of the other commands. This causes that command to be repeated nnnnnnnnn times before FDMTST asks the operator for another command.

TSTCAN permits testing of the cancel function (IO.KIL) to a terminal.

PRINTER exercises the external printer attached to an RT805 or the device connected to a DPM01, VT110, or DYT01.

CHANGE allows the operator to select a new set of attributes for the selected DPM01, VT110, or DYT01 port. Once selected, this new set of attributes is immediately down-line loaded.

SEL=ooo commands FDMTST to deselect (disconnect from) the currently selected terminal and to select (connect to) a new terminal whose device number is ooo (octal). SEL=ddd. is equivalent, but ddd is interpreted as a decimal device number, due to the trailing decimal point.

SEL =+ commands FDMTST to deselect the current terminal and to select the terminal with the next higher device number. SEL=- is similar, but selects the terminal with the next lower device number. SEL=+ or SEL=-, in conjunction with the carriage return key, furnish a simple method for examining the current attributes in all four ports of a DPM01 or VT110.

When FDMTST prompts for another command, pushing the carriage return key causes FDMTST to re-execute the last command.

The following FDMTST commands are equally applicable to both RT80x terminals and terminals connected to a DPM01, VT110, or DYT01.

MSG= HI, MOM...	Enter message for WRITs and PRRDs
MSG(010)=ITS NW...	Add to existing message
MSG(014)=M	Replace character of existing message
MSG(015)“105”	Replace character of existing message
MSGS=101-176	Enter message string
CLOCK	Display date and time on terminal
SHOW fl	Show lines of characters on terminal
REPEAT=987654321	Enter repeat count
TSTCAN	Test cancel function
PRINTER	Print sequence of messages on terminal
SEL=ooo and SEL=ddd.	Select different terminal
SEL=+ and SEL=-	Select next higher or lower terminal

The following FDMTST commands are only applicable to RT80x terminals:

DIG	Copy digital inputs to outputs and display
ROSC nn	Cause relay to oscillate nn times
WRIT DM t s	Write display message
WRIT DG t s	Write to digital output
WRIT PR t s	Write to external printer
WRIT RD t s	Write relay to deenergize
WRIT RE t s	Write relay to energize
WRIT TM t s	Write time-out message
WRITE sf t s	Same as WRIT sf t s
WRITV sf t s	Write variable length message
READ DG t s	Read digital inputs
READ BD t s	Read 22-column T-3 Badge
READ HO t s	Read 80-column T-3 Hollerith card
READ MS t s	(Reserved)
READ ST t s	Read 22-column T-3 Stub card (ticket)
READ TK t s	Read transaction key
READ T5 t s	Read T-5 Badge, no local prompts
READ W5 t s	Read T-5 Badge, with local prompts
PRRD QK t s	Display query, in from keypad
PRRD QX t s	Display query, in from ext. keyboard
PRRD FK t s	Display form, in from keypad
PRRD FX t s	Display form, in from ext. keyboard
PRRD PX t s	Print query, in from ext. keyboard
PRRD BD t s	Prompt, then read T-3 Badge
PRRD HO t s	Prompt, then read T-3 Hollerith card
PRRD MS t s	(Reserved)
PRRD ST t s	Prompt, then read T-3 Stub card
PRRD TK t s	Prompt, then read transaction key
PRRD T5 t s	Prompt, read T-5, no local prompt
PRRD W5 t s	Prompt, read T-5, with local prompt

The following FDMTST commands are only applicable to conventional terminals connected via a DPM01, VT110, or DYT01.

CHANGE	Change DPM01, VT110, or DYT01 attributes
WRIT FO	Write formatted (means first byte is VFC byte)
WRIT TR	Write transparent
READ FO	Read formatted and echo characters to device
READ FN	Read formatted, no echo
READ TR	Read transparent and echo characters to device
READ TN	Read transparent, no echo
READ TL	Read translucent and echo characters to device
READ LN	Read translucent, no echo
READ AT	Read and decode attributes from DPM01, VT110, or DYT01 port
PRRD FO	Write formatted prompt, then read formatted and echo characters to device
PRRD FN	Write formatted prompt, then read formatted, no echo
PRRD TR	Write transparent prompt, then read transparent and echo characters to device
PRRD TN	Write transparent prompt, then read transparent, no echo
PRRD TL	Write formatted prompt, then read translucent and echo characters to device
PRRD LN	Write formatted prompt, then read translucent, no echo

8.3 DPMTST

DPMTST supplies an on-line tool for an operator to exercise and test all features of the DPM01, VT110, and to demonstrate the capabilities of conventional terminals connected to them. Optionally, DPMTST can be used for testing a DYT01. DPMTST contains two tests:

1. A demonstration test which uses one to four terminal devices, (VT52 or LA36, for example), connected to the DPM01, or VT110 (or one terminal connected to a DYT01). This test permits operators to select various sub-tests to demonstrate and test the features of terminals connected to the DECdataway through a DPM01, VT110, or DYT01.
2. A loop-back test which uses externally connected loop-back cables (port-to-port) to test all major features of the DPM01, or VT110 and to verify its end-to-end data integrity.

DPMTST begins by asking the operator at the MCR terminal for a controller number and base port. DPMTST next asks the operator which of the four DPM01 or VT110 ports will be used.

NOTE

DPMTST is designed to test four-port multiplexers (DPM01/VT110). When testing DYT01s, you must respond to DPMTST's questions as if each DYT01 were a port within a multiplexer. Each DYT01 emulates a DPM01 port as shown in the following table.

Table 8-1 lists the emulated DPM01 base port/multiplexer port numbers.

Table 8-1 Emulated DPM01 Base Port/Multiplexer Port Numbers

DYT01 at Controller Port No.	Emulated DPM01 Base Port	Emulated DPM01 Multiplexer Port
1	0	0
2	1	1
3	1	2
4	1	3
5	5	0
6	5	1
7	5	2
8	5	3
9	9	0
10	9	1
11	9	2
12	9	3
13	13	0
14	13	1
15	13	2
16	13	3
17	17	0
18	17	1
19	17	2
20	17	3
21	21	0
22	21	1
23	21	2
24	21	3
25	25	0
26	25	1
27	25	2
28	25	3
29	29	0
30	29	1
31	29	2

DPMTST will attach itself to all ports which the operator claims at this time, thus preventing their use by other tasks. If running DPMTST in loop-back mode on two DPM01 or VT110 ports, it may be advisable to claim all four ports for DPMTST; the processing load on the DPM01 or VT110 caused by DPMTST could cause transient loss of data on the other ports. If running DPMTST to demonstrate terminals, there is no reason to prevent other tasks from sharing this DPM01 or VT110.

DPMTST next asks the operator to select loop-back mode or demonstration mode.

Note that, in demonstration mode, DPMTST does not change the attributes in the DPM01, VT110, or DYT01. These attributes must already be correctly set for the devices connected to the DPM01, VT110, or DYT01, either by using the ATGEN utility task before the DPM01, VT110, or DYT01 came on-line or by using FDMTST to load temporary attributes.

In loop-back mode, DPMTST changes the attributes. After the DPMTST loop-back test, if real terminals are connected to the DPM01 or VT110 ports, the original attributes are not restored unless the DPM01 or VT110 is turned off while cables are being connected.

8.3.1 DPMTST Loop-Back Testing

When the loop-back mode of DPMTST is selected, DPMTST asks the operator which ports are connected together by the external loop-back cables. It does not matter which port is mentioned first by the operator.

DPMTST next asks the operator how long DPMTST is to run (in hours). Runs of over one week can be requested. If the operator responds with the carriage return key, which does not explicitly enter a run time, DPMTST will run one complete pass (which requires 30–45 minutes) and then exit.

DPMTST next asks the operator what the first test and last test should be for this run. For a complete test run, the operator should respond to these questions with the carriage-return key, which defaults to the first and last implemented tests.

DPMTST next asks the operator about tracing DPMLOP. Since tracing consumes host processor time, degrades testing, and supplies little useful information, the operator should respond to this question with the carriage return key, which means NO.

DPMTST then asks the operator about halting when an error occurs in DPMLOP. If the input terminal is a video terminal, the operator will normally answer this question YES (or just Y), to avoid having the error messages scrolled off the screen. If the input terminal is an LA36, the operator will normally answer this question with the carriage-return key.

The loop-back mode of DPMTST involves three segments of code:

1. DPMLOP, the main set of tests, transmits data from the host, out through one DPM01 or VT110 port, in through a different DPM01 or VT110 port, and back to the host for data checking. DPMLOP tests a variety of data patterns, baud rates, UART control patterns, termination character patterns and conditions, VFC codes, both modes of writing, all six modes of reading, echo suppression, and CRT and non-CRT delete processing.

2. DPMCON, which runs before DPMLOP, primarily tests that the loop-back cables are in place as defined by the operator. DPMCON performs this test at baud rates of 3600, 4800, 7200, and 9600.

3. DPMXON, which runs after DPMLOP, tests processing of X/ON and X/OFF characters at several baud rates.

At its conclusion, DPMLOP reports the amount of data transferred. If all four ports are used, the primary pair should transfer about 120–150 kilobytes/hour, and the secondary pair 5–20 percent less.

Under conditions of very heavy traffic on the DECdataway, DPMTST may terminate due to excessive round-trip message times. The event is indicated as follows:

```
DPMXON - CALL FDSTAT, BAD RESULT = AC,...
```

All error messages from DPMTST are reported on the MCR terminal. Since the loop-back mode of DPMTST is intended as an acceptance test, rather than a diagnostic, the error messages are not entirely self-explanatory and will not be defined.

Error messages which include one of the following three statements are likely to be due to excessive noise on the DECdataway, excessive noise on the ac power which supplies the DPM01 or VT110, or because of transient loss of ac power:

```
DEVICE NOT READY
I-O ABORTED
DEVICE OFF-LINE
```

Any condition which causes one of these three types of error message is likely to prevail for a few seconds. Therefore, these conditions will commonly cause a burst of errors and a burst of error messages. Since DPMLOP's error reports include the approximate time of the error, these error bursts should be recognizable as related events.

If the DPM01 or VT110 goes off-line for more than a few seconds, DPMLOP may not be able to recover. This may be recognized by an error report which includes the line:

```
CALL FDCONN FOR ... BAD RESULT = TN.
```

If DPMLOP cannot recover due to the above case, it will exit.

The classes of errors discussed above are all hard errors, which should correspond to detected errors in the DECdataway error log (RUN ISBRPT to see). If the DECdataway is in a noisy environment, this error log may also show some soft errors (repeat count less than 4) which did not cause DPMTST to detect errors.

If DPMTST reports errors which do not correspond to events recorded in the DECdataway error log, the DPM01 or VT110 hardware is suspect. While noise could cause this class of error, the probability is extremely low. The error rate for this class of error, with standard loop-back cables, should be less than one per day.

8.3.2 DPMTST Terminal Demonstration

DPMTST begins demonstration of terminals by asking the operator at the MCR terminal what devices are connected to each of the ports to be used. DPMTST understands LA35, LA36, LA180, VT50, VT52, and VT55 as answers. If the operator replies with a different answer, DPMTST will ask the operator for information about the terminal:

- Is this an ASCII device? Yes means that the device has an ASCII-encoded set of printable characters and responds to ASCII line-feed and carriage return characters. DPMTST cannot use non-ASCII devices.
- Does this device have a keyboard? Yes means that the device has an ASCII-encoded keyboard which includes at least A-Z and a carriage-return key.
- Maximum print-line size? DPMTST cannot use devices which have a print line of less than 32 characters.
- Does this device print lower-case? DPMTST will use either.

Once DPMTST has acquired the device-type information, it ceases to use the MCR terminal, and begins running the one to four devices connected via this DPM01, VT110, or DYT01.

For devices without keyboards, DPMTST endlessly transmits a sequence of predefined data patterns:

- An alphabet
- A rotating alphabet
- Lines of "HHHHHH", for printer alignment
- A box of plus signs
- Lines of each character
- Time and date
- Lines to test carriage control characters

For devices with keyboards, DPMTST asks the operator at that device to select a demonstration sequence. These include each of the sequences used for devices without keyboards, plus several feedback sequences, each of which prompts for data from the device's operator, and returns an image of that data to the device. These demonstration sequences can be used to validate the operation of the terminal device, as well as to demonstrate DPM01, VT110, and DYT01 features such as character echo, horizontal tab handling, CRT-delete, end-of-line wrap-around, and CTRL/S and CTRL/Q processing.

When DPMTST begins using a keyboard device interfaced to a DPM01, VT110, or DYT01, it asks that device's operator if he wants help; if the answer is YES (or just Y), DPMTST will produce a menu of demonstration sequences. The operator can subsequently recall the menu, when DPMTST prompts for a command, by typing HELP or ? or any undefined command.

8.4 CNFIGH, CNFIGR: DIS SYSTEM CONFIGURATION TASKS

A host task (CNFIGH) and a remote task (CNFIGR) can be used to validate both the host and the remote build procedures for DPM systems that have DISs. CNFIGR determines the peripherals that are present on the remote, and communicates this information to CNFIGH using DPM network facilities. CNFIGR prints the peripheral configuration at the DIS console terminal, if any.

CNFIGR also determines the configuration of I/O modules in the DIS and the size of DIS memory. This information is also communicated to CNFIGH, which reports the entire DIS configuration at its host terminal. If CNFIGH fails to report the presence of I/O modules that are physically present in a DIS, then it is likely that the modules are not properly addressed for the IP11 driver. (See the *IP11/IP300/DPM50 Application Programmer's Guide* for the module addressing rules.)

Successful communication between CNFIGR and CNFIGH also verifies that the following DPM components are functioning properly: the DECdataway controller driver and its support software, the host and remote network software, and DLC.

To use the pair of tasks when your host and remote build procedures are complete, install CNFIGH in the DPM host system.

Build the CNFIGR task and use VMR to install, fix, and run CNFIGR in the DIS system image at the host. Down-line load the system image to the DIS using DLC. Then run CNFIGH.

As a convenience for verifying host network software before you build the remote system, the distribution kit supplies a pregenerated DIS image as a file named CONFIG.SYS. The CNFIGR task and a complete peripheral and I/O module configuration are built into CONFIG.SYS. You can down-line load CONFIG.SYS to a DIS and run CNFIGH.

Currently, 15 peripherals are reported. These include 12 terminals (TT0-TT13), dual floppy discs (DX0-DX1), and a line printer (LP). The status of each device is listed as one of the following:

- PRESENT physically present and on-line
- OFFLINE in system configuration but not physically present
- NOT READY in system configuration, physically present, but off-line
- NOT SYSGENED device not included in system generation or driver not loaded

The first part of the report lists digital and D/A modules (including counters) reported by the IP11 driver. The second part of the report lists A/D modules. There are 11 possible module types:

1. Digital sense
2. COS interrupt
3. Digital sense interrupt
4. Digital output
5. Single-shot output
6. D/A output
7. 8-bit input counter
8. 16-bit input counter
9. 16-bit output counter

10. A/D converter, with multiplexer

11. A/D converter, without multiplexer

When no modules are present, an appropriate message is printed on the issuing host terminal.

An RSX-11S system image containing CNFIGR and the corresponding symbol definition file are included in the distribution kit. The file names are:

CONFIG.SYS RSX-11S system image

CONFIG.STB RXS-11S symbol definition file

The source and build files of both tasks (CNFIGH, CNFIGR) and the task image file of CNFIGH are also on the distribution media, allowing the user to include these programs in his own system. The host task file names are:

CNFIGH.MAC host source file

CNFIGH.BLD host build file

CNFIGH.TSK host task file

The remote task file names are:

CNFIGR.MAC remote source file

CNFIGR.BLD remote build file

e 8-1 is an example of running CNFIGH and CNFIGR with CONFIG.SYS. The CONFIG.SYS system image containing CNFIGR is down-line loaded to a DIS, using the DLC utility. The host task then is initiated from a host terminal.

DLC then prints information concerning the status of the booting procedure. Next, the command RUN CNFIGH is entered. CNFIGH must be an installed task or the program will not continue. The user then is prompted to enter a nodename. This must be the exact name used with the /NO switch in the DLC command.

When the CONFIG.SYS system is down-line loaded, CNFIGR will come up running (prescheduled by VMR). If CNFIGH is run again on the same port without again down-line loading the system image, the RUN CNFIGH command must be entered at the remote console.

The sample output shows that one terminal is present and three other terminals are configured but not physically present. No other devices are configured.

The report shows that five digital and two analog module types are present. The first two digital entries have the following meanings. The digital sense module uses bytes 0–3 of the address space, beginning at physical address 171014. The digital sense interrupt module uses bytes 0–7 of the address space, beginning at physical address 171020.

The first analog entry has the following meaning. The first A/D converter has a multiplexer with a maximum of 255 channels. Therefore, the maximum relative entry in the mapping table is 255. The corresponding physical address is 171040. There are 16 channels present, 0–15.

Figure 8-2 illustrates the output from the remote if the DIS has a console terminal. When the remote is down-line loaded, devices that are not physically present are reported as "NOT IN CONFIGURATION". The remote task CNFIGR also identifies itself while it is running and when it has completed.

```
    DLC>CONFIG.SYS/BO:3/NO:CONFIG
    DLC -- BOOTING PORT 3 NODENAME CONFIG
    DLC -- PORT 3 NODENAME CONFIG SYSTEM BOOTED
    DLC>^Z

    >RUN CNFIGH
    ENTER NODENAME:
    >CONFIG

                        DPM50 SYSTEM CONFIGURATION

         TT0           PRESENT
         TT1           OFFLINE
         TT2           OFFLINE
         TT3           OFFLINE
         TT4           NOT SYSGENED
         TT5           NOT SYSGENED
         TT6           NOT SYSGENED
         TT7           NOT SYSGENED
         TT10          NOT SYSGENED
         TT11          NOT SYSGENED
         TT12          NOT SYSGENED
         TT13          NOT SYSGENED
         LP            NOT SYSGENED
         DX0           NOT SYSGENED
         DX1           NOT SYSGENED

                                 MAPPING TABLE

            MODULE TYPE    MAXIMUM RELATIVE   PHYSICAL ADDRESS
                                ENTRY          OF FIRST BYTE

         DIGITAL SENSE               3                171014
         DIGITAL SENSE INTERRUPT     7                171020
         SINGLE-SHOT OUTPUT          1                171170
         8- BIT INPUT COUNTER        3                171010
         16- BIT INPUT COUNTER       1                171260

MODULE TYPE   MAXIMUM RELATIVE  PHYSICAL ADDRESS   LEGAL CHANNELS PER
               CHANNEL ENTRY    OF CONVERTER         MULTIPLEXER

A/D CONVERTER, MUX  255             171040             0 - 15
     MUX1                                              NONE
     MUX2                                              NONE
     MUX3                                              NONE
     MUX4                                              NONE
     MUX5                                              NONE
     MUX6                                              NONE
     MUX7                                              NONE
A/D CONVERTER       511             171300             0 - 15

    REMOTE MEMORY SIZE= 64KB.

    >
```

Figure 8-1   DIS System Configuration--Sample Host Output

```
RSX    11S V2.1 BL22

           DEVICE DX00: NOT IN CONFIGURATION
           DEVICE DX01: NOT IN CONFIGURATION
           DEVICE LP00: NOT IN CONFIGURATION
           DEVICE TT01: NOT IN CONFIGURATION
           DEVICE TT02: NOT IN CONFIGURATION
           DEVICE TT03: NOT IN CONFIGURATION
           DEVICE TT06: NOT IN CONFIGURATION
           DEVICE TT07: NOT IN CONFIGURATION
           DEVICE TT10: NOT IN CONFIGURATION
           DEVICE TT11: NOT IN CONFIGURATION
           DEVICE TT12: NOT IN CONFIGURATION
           DEVICE TT13: NOT IN CONFIGURATION
           >
           CNFIGR RUNNING
          CNFIGR COMPLETED
```

Figure 8-2 DIS System Configuration—Sample Remote Output

PART IV
SYSTEM OPERATION

CHAPTER 9
DPM/DPM-PLUS UTILITIES

This chapter describes the utility programs used for DPM/DPM-PLUS system management.

Informational Utilities	
• SPY	SPY dynamically monitors the status of up to 20 DECdataway devices, or up to 32 host-remote connections on both ports of a DIS, simultaneously.
• NISTAT	NISTAT reports open DIS nodes and their logical connections.

Configuration Utilities	
• CBC	CBC displays and changes DECdataway address assignments.
• LAT	LAT causes attributes to be loaded to a DYT01 or a single port of a DPM01 or VT110 multiplexer.

Task Dispatcher Utilities	
• FDD	FDD connects to or disconnects from the FDM Dispatcher a specific DECdataway terminal.
• CDU	CDU connects to or disconnects from the ATS Dispatcher a specific DPM01, VT110, DYT01 or TT: terminal. CDU is a DPM-PLUS utility.

9.1 INFORMATIONAL UTILITIES

9.1.1 SPY

The SPY utility is a task that dynamically monitors the status of DECdataway devices. SPY dynamically updates and refreshes the data displayed on CRT terminals, and gives a snapshot view of the network on hard copy terminals.

9.1.1.1 SPY Display Features—SPY displays the following information:

- The current date and time
- The current error sequence number for the SB device controller
- The unit number of all SB devices

- The unit number of all SB devices of a certain type (such as online, available, DIS, etc.)
- The type of each SB device (e.g. DIS, DAT, etc.)
- The port number of each SB device within a DIS or DAT
- The controller number of each SB device
- The name of the task attached to each SB device
- The I/O function in progress
- The task that issued the I/O function
- The status of all SB devices (e.g. online, available, cancel in progress, etc.), or the status of a certain group of SB devices
- The activity of up to 20 SB units simultaneously, or the status of all connections of a DIS.

9.1.1.2 SPY Report Page for DIS Channel Activity—The NET report displays the following additional information on host-remote channels:

- The node name for the DIS
- The number of active connections and the maximum number of connections possible
- The number of pending host and remote connections

SPY displays the following information for each active connection. Connections may be examined simultaneously):

- The names of the host task and remote tasks
- The host task's LUN (0 if the connection is pending from the remote, PND if the connection is pending from the host)
- The number of pending host transmits and receives if a connection has been established

9.1.1.3 Using SPY—SPY prompts you with a series of questions that tell it your terminal type and the kind of report you desire. For each query, responding with a RETURN gets you the default answer. When SPY receives an incorrect response, it displays the appropriate error message and then repeats the question. SPY questions are:

TERMINAL TYPE [VT100] ?>

SPY must know your terminal type. Valid responses to this question are: VT100 (default), VT52, or LA36 (any other terminal). If you type an invalid response, you get an error message. Then, the initial question is repeated.

The next question is:

REPORT TYPE [AVA] ?>

Valid report types are:

ONL	for DPM systems indicates the device is connected to the DECdataway and powered on; for DPM-PLUS systems, under RSX–1M-PLUS, the device has been configured ONLINE using the CON command. Broadcast channels will be included in this display. This is the default report type for RSX-11M systems.
DAT	displays only those SB units connected to a DPM01, VT110, or DYT01.
DIS	displays only DISs.
RT8	displays only RT80x terminals.
ACT	displays DISs with active connections.
ALL	displays all SB units, including broadcast channels.
NET	displays information for DIS connections.
AVA	indicates the device is connected to the DECdataway and is powered on. This is the default report type for RSX-11M-PLUS systems.

The next question is:

FIRST UNIT TO MONITOR [0] ?>

You may select any SB unit number between 0 and the maximum unit number specified at system generation. SPY rejects decimal numbers, or numbers beyond the range configured for the system. The default answer for this question is 0.

The fourth and final question:

REFRESH SPEED IN TICKS [55.] ?>

You may adjust the speed at which the dynamic display is updated on a CRT terminal. The permissible range is 0-999(decimal) ticks; the default is 55 ticks.

9.1.1.4 Standard Report Page—This section presents the default display mode with an illustration of the display produced. Numbers in the text of the explanation refer to numbers in Figure 9-1, which follows below.

```
>SPY

SPY UTILITY V1.0
TERMINAL TYPE [VT100] ?>LA36
REPORT TYPE [AVA] ?>
FIRST UNIT TO MONITOR [0] ?>
SPY UTILTIY V1.0             10-JUN-82  10:09:21.2       ERROR SEQUENCE = 00011
UNIT    TYP P  C/U   ATTACH   FCTN   ISSUER  <-------------STATUS-------------->

SB000:  BRO 0  A/00  XXXXXX  IO.XXX  XXXXXX  ONL AVA
SB001:  DIS 0  A/01  DPM50H  IO.RLR  DPM50H  ONL AVA         ATO IOP
SB002:  DIS 1  A/02  DPM50H  IO.WLR  DPM50H  ONL AVA         ATO IOP
SB100:  BRO 0  B/00  XXXXXX  IO.XXX  XXXXXX  ONL AVA
SB101:  DAT 0  B/01  SB101   IO.XXX  XXXXXX  ONL AVA ATS
SB102:  DAT 1  B/02  XXXXXX  IO.XXX  XXXXXX  ONL AVA ATS
SB103:  DAT 2  B/03  SB103   IO.XXX  XXXXXX  ONL AVA ATS
SB104:  DAT 3  B/04  XXXXXX  IO.XXX  XXXXXX  ONL AVA ATS
SB105:  RT8 0  B/05  XXXXXX  IO.XXX  XXXXXX  ONL AVA
```

Figure 9-1 Default SPY Report

SPY asks only three questions when run from a hard-copy terminal; the question about refresh speed does not apply. We responded to the second and third questions with RETURNs, so we got the default report for an LA36.

On the first line of the report, item 1 identifies the SPY utility and tells which version number is running. Item 2 is the date; item 3 is the time on a 24-hour clock, given to the tenth of a second. Item 4 is the port identification in this form:

SBxx: = CTRL m, UNIT n, IS A descr

where
SBxx: is the port's DECdataway address, CTRL m is the DECdataway controller number on the system, UNIT n is the port number on that controller, descr is a description of the device at that port–BROADCAST PORT, DPM50 (PORT P), DPM01, VT110, or DYT01 (PORT P) or RT80x TERMINAL.

The second line of the report consists of column headers. Item 5 is the UNIT column, which contains the unit number of each SB device included in the report in octal. Unit numbers may range from 000 to the maximum configured during system generation. Item 6, TYP heads the column specifying the type of each SB device listed in the report. There are four possible types of SB devices:

SB DEVICE	MEANING
BRO	broadcast
DAT	DECdataway applications terminal (a terminal connected to a multiplexer, or to a DYT01)
DIS	DECdataway intelligent subsystem
RT8	RT80x terminal (RT801, RT803, or RT805)

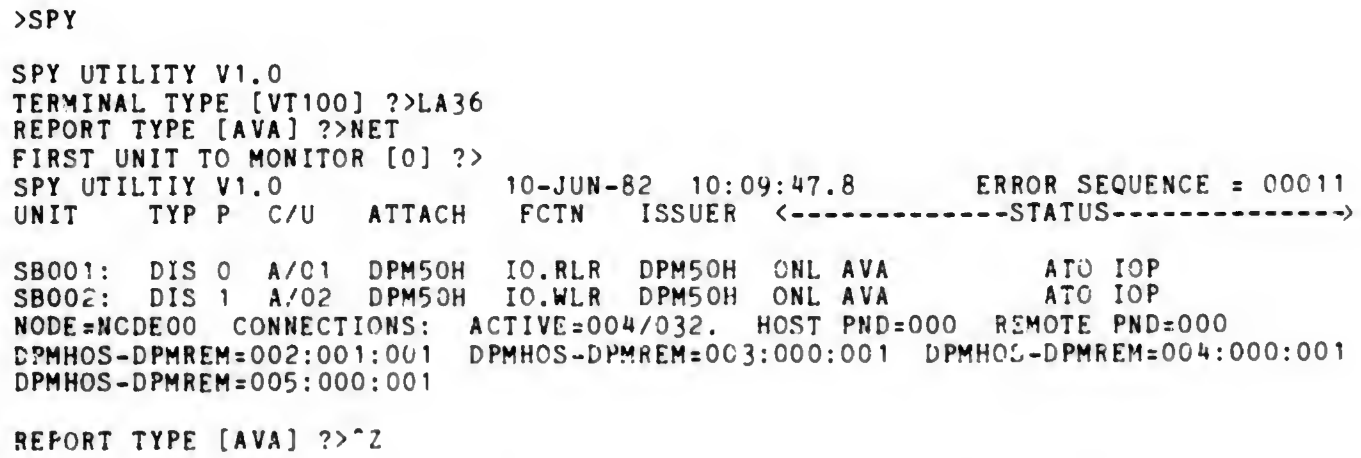
Item 7, P, stands for port number. The possible port numbers are listed below:

SB DEVICE	POSSIBLE PORT NUMBERS
BRO	0
DIS	0,1
DAT	0,1,2,3
RT8	0

Item 8, C, stands for controller number, which may be a number from zero to three (for RSX-11M systems) or a letter from A to D (for RSX-11M-PLUS systems). Item 9, U, stands for the unit number on the controller, which must be in the range 0-77 (octal).Item 10, ATTACH, refers to the attached task; XXXXXX means that no task is attached. Notice that there is only one attached task in this sample display–DPM50H. Item 11, FCTN, stands for the I/O function in progress. IO.XXX means that no I/O function is in progress. Item 12, ISSUER, refers to the task that issued the I/O function (XXXXXX means not applicable, since no I/O function is in progress). Item 13, STATUS, lists the status of each SB device reported; more than one term may apply to a single device. The meaning of the status codes is as follows:

STATUS CODE	MEANING
ONL	online
OFL	offline
RQO	requesting online
AVA	available (RSX-11M-PLUS only)
IOP	I/O in progress
CAN	cancel in progress
PWQ	I/O in port wait queue
ATO	attached for online/offline notification
ATS	mounted as ATS
UNL	unloaded (only one showing)
UMD	attached for user mode diagnostics

9.1.1.5 Channel Activity Report Page—This section presents the DIS connection activity report page with an illustration of the display produced by an LA36 terminal and a detailed explanation of each feature of that display. Numbers in this explanation refer to numbers in Figure 9-2.



```
>SPY

SPY UTILITY V1.0
TERMINAL TYPE [VT100] ?>LA36
REPORT TYPE [AVA] ?>NET
FIRST UNIT TO MONITOR [0] ?>
SPY UTILTIY V1.0                10-JUN-82  10:09:47.8       ERROR SEQUENCE = 00011
UNIT    TYP P  C/U   ATTACH   FCTN   ISSUER  <-------------STATUS------------->

SB001:  DIS 0  A/01  DPM50H  IO.RLR  DPM50H  ONL AVA         ATO IOP
SB002:  DIS 1  A/02  DPM50H  IO.WLR  DPM50H  ONL AVA         ATO IOP
NODE=NCDE00  CONNECTIONS:  ACTIVE=004/032.  HOST PND=000  REMOTE PND=000
DPMHOS-DPMREM=002:001:001  DPMHOS-DPMREM=003:000:001  DPMHOS-DPMREM=004:000:001
DPMHOS-DPMREM=005:000:001

REPORT TYPE [AVA] ?>^Z
```

Figure 9-2 Channel Activity Report Page

In this example, we began monitoring at SB040. SPY monitors the first DIS pair after the unit specified, in this case, SB067 and SB070. The first three lines of this report have already been explained in the section STANDARD REPORT PAGE above. Item 1, NODE, identifies the node name for the DIS. In this case the node name is ED. Item 2, CONNECTIONS:, introduces the connections summary. Item 3, ACTIVE, gives the number of active connections (in this case zero) / and the number of possible connections (in this case 32.). Item 4, HOST PND=, gives the number of pending host connections (in this case zero). Item 5, REMOTE PND=, gives the number of remote pending connections (again, zero in the example).

The remaining items refer to single connections. Item 6, HSTNAM, refers to the name of the host task (in this case). Item 7, REMNAM, refers to the name of the remote task (called in our example). Item 8 LUN, refers to the host's logical unit number. Item 9, TRN, gives the number of pending host transmits. Item 10, PND, is the connection pending from the host. Item 11, REC, is the number of pending receives from the host. REC is blank if a transmit is pending from the host.

9.1.1.6 The SPY Help Page—You may access the SPY help page from a CRT terminal. Enter the SPY help page at any time after a full screen of information has been displayed by responding to a command prompt with H. Most of the commands listed in the help page display (Figure 9-3) are self-explanatory. R replots the report page displayed before help was entered. You might wish to CRTL/Z and return to the initial SPY questions to examine a different type of SB device, or change the refresh speed of your report. Change the first unit monitored by entering the desired octal number (and RETURN) from the help page. Advancing the display or moving it backward will change the display by one screen-full (or 20 SB units).

9.1.1.7 SPY Error Messages–These are SPY error messages. They appear in alphabetic order.

SPY - INVALID REPORT TYPE: ENTER ONL, ACT, NET, ALL, DIS, DAT, RT8, AVA

> An invalid report type has been entered.

SPY - INVALID SPEED: RANGE IS 0. TO 999.

> An incorrect entry for refresh speed has been entered.

SPY - INVALID TERMINAL TYPE: ENTER VT100, VT52, OR LA36

> An invalid terminal type has been entered.

SPY - INVALID UNIT NUMBER: RANGE IS 0 TO nnn OCTAL

> An incorrect entry for first unit number (where nnn is the maximum SB unit number specified at system generation) has been entered.

SPY - THERE ARE NO SB DEVICES ON THIS SYSTEM

> DECdataway software is not running.

9.1.2 NISTAT

NISTAT reports at your terminal the status of DIS nodes and their logical connections.

You may run NISTAT uninstalled by typing:

```
RUN $NISTAT
```

NISTAT then asks you two questions about the desired report, as follows:

WANT TO LIST CONNECTIONS?>

Enter Y if you want NISTAT to include for each node the list of host and remote tasks in each connection pair.

WANT TO LIST NODE AND CONNECTION DETAILS?>

If you answered N to LIST CONNECTIONS, NISTAT just asks:

WANT TO LIST NODE DETAILS?>

Enter Y if you want details added to the report, as described below.

The NISTAT report has an entry for each open DIS node, the first line of which is:

```
SBxx: nodename IS OPEN
```

If you requested node details, the next line lists the number of active connections to the node.

If you requested connections listed, NISTAT lists the names of host and remote tasks engaged in each logical connection.

If you requested connection details, each listing of a host/remote task pair is followed by:

- Host task's logical unit number (LUN)
- Number of transmit requests pending for the host task
- Number of receive requests pending for the host task

You may install NISTAT with task name ...NIS. To run the installed NISTAT, type:

```
NIS
```

NISTAT then lists the connections for each open DIS. (Running the installed NISTAT is equivalent to answering Y and N to the two questions.)

Example:

```
>RUN $NISTAT
     NETWORK STATUS REPORT -
     WANT TO LIST CONNECTIONS?>Y
     WANT TO LIST NODE AND CONNECTION DETAILS?>
SB 16: = BOBWO1 IS OPEN.
     HOST TASK = 'SAMHOS', REMOTE TASK ='SAMREM'.
     END OF NETWORK STATUS REPORT.
```

9.2 CONFIGURATION UTILITIES

CBC dynamically alters or displays the device assignments for DECdataway addresses. There are four possible device types to which a DECdataway address may be assigned: DYT01, RT80X, DPM01, and DIS. Because DPM01 and DIS are multi-address devices, configuring an address as a DPM01 also causes the next three contiguous addresses to be assigned to DMP01; configuring an address as a DIS also causes the next address to be assigned to DIS.

When a DPM or DPM-PLUS system is started, CBC must be run to define the configuration. For this purpose, the System Manager typically includes CBC commands in the DPM startup command file.

CBC may be run by typing the command line

```
CBC /keyword[=SBnn:]

CBC commandfil
```

where /keyword is a legal CBC switch, SBnn: is a DECdataway address, and commandfil is the name of a command file containing commands to be executed by CBC.

Keywords for CBC are:

/DYT01 /DPM01 /DIS /RT80X.

If =SBnn: is omitted from the command, CBC will display all the DECdataway addresses that are configured as the device type indicated by the keyword.

Keyword Definitions:

/DYTO1=SBnnn:	Configure the address SBnnn: as a DYT01. SBnnn: must not be currently assigned to DPM01 or DIS.
/NODYT01	Display the DECdataway addresses that are NOT configured as DYT01s. (May not be used with SBnnn:.)
/DPM01=SBnn:	Configure the four addresses starting with SBnn: as a DPM01/VT110. All four addresses must be currently configured as DYT01 or RT80X.
/NODPM01=SBnn:	Configure the four addresses starting with SBnn: as DYT01s. The four addresses must be currently configured as a DPM01/VT110.
/DIS=SBnn:	Configure the two addresses starting with SBnn: as a DIS. Both addresses must be currently configured as DYT01 or RT80X.
/NODIS=SBnn:	Configure the two addresses starting with SBnn: as DYT01s. The two addresses must be currently configured as a DIS.
/RT80X=SBnn:	Configure the address SBnn: as an RT80X. SBnn: must not be currently configured as a DPM01 or DIS.
/NORT80X=SBnn:	Configure the address SBnn: as a DYT01. SBnn: must be currently configured as an RT80X.

CBC will not allow reconfiguration of addresses that are busy, attached, or mounted.

NOTE

> **Addresses that are configured to be DYT01s or DPM01s will not have ATS support until the SBTACP is reinitialized. Only those addresses that are already configured as DYT01s or DPM01s when SBTACP is run will get mounted.**

Examples:

```
>CBC /DIS
```

displays all DECdataway addresses configured as DISs.

```
>CBC /NODYT01
```

displays all DECdataway addresses that are NOT configured as DYT01s.

```
>CBC /DIS=SB7:
```

configures SB7: and SB10: as the base and second ports of a DIS.

```
>CBC /NODIS=SB21:
```

configures SB21: and SB22: as DYT01s.

9.2.1 CBC Error Messages

CBC...SB DRIVER NOT LOADED

DECdataway software is not running. See Chapter 7 for DPM startup procedures.

CBC...MUST SPECIFY SB DEVICE

Device following the equal sign is not a DECdataway address (SBxx:).

CBC...ILLEGAL UNIT NUMBER

The DECdataway address specified in the command exceeds the highest address for the number of ports configured in the host build procedure.

CBC...UNIT NUMBER MUST BE IN OCTAL

DECdataway unit number contained the digit 8 or 9.

CBC...MUST SPECIFY BASE PORT

The DECdataway address specified in the command is not the base port of a DIS, DPM01, or VT110.

CBC...NOT ENOUGH FREE PORTS FOR DEVICE ASSIGNMENT

Assigning a DIS requires one free (DYT01 or RT80x) port following the base port. Assigning a DPM01, or VT110 requires three free ports following the base port.

CBC...SYNTAX ERROR

A switch or address was not typed properly in the command.

CBC...BASE PORT SPECIFIED IS A BROADCAST CHANNEL

The address of a broadcast channel is never free for assignment.

CBC...DEVICE ASSIGNMENT OVERLAPS CONTROLLERS

The DECdataway address assigned to a DPM01, or VT110 must be fourth from the highest address on a controller, or lower. Similarly, a DIS may not be assigned the highest address on a controller.

CBC...UNIT IS BUSY
CBC...UNIT IS ATTACHED
CBC...UNIT IS MOUNTED

You cannot clear a DECdataway address if the device is busy, attached, or mounted.

9.2.2 LAT

LAT is a utility which loads attributes for a DPM01, VT110, or DYT01 port. Because several types of devices can be connected to a DPM01, VT110, or DYT01, attributes for each port must be down-line loaded.

You define the attributes for every DPM01, VT110, or DYT01 port using the program ATGEN, described in Chapter 6. The generated attributes are stored in a file.

When a DPM01, VT110, or DYT01 comes on line, the DECdataway driver (SBDRV) runs a program named ISBONL, which loads attributes for that DPM01, VT110, or DYT01 port(s).

After a DPM01, VT110, or DYT01 is on line, you may run LAT to load attributes of any single port. This is useful when terminals are reconnected to a DPM01, VT110, or DYT01. LAT spawns the ISBONL program, which loads attributes from the attribute file as if the DPM01, VT110, or DYT01 had just come on line.

To run LAT, type:

```
RUN $LAT
```

LAT issues the prompt:

```
LAT>
```

Enter the DECdataway address of a DPM01, VT110, or DYT01 port for which attributes will be loaded, in the form:

```
SBxx:
```

After the attributes are loaded, LAT issues another prompt.

To exit LAT, enter CTRL-Z.

You may also install LAT with task name . ..LAT. If LAT is installed, you may type LAT SBxx: and avoid the prompt.

Example:

```
>RUN $LAT
LAT>SB23:
LAT...COMPLETED
LAT>↑Z
```

9.2.2.1 LAT Error Messages—LAT prints messages for errors it detects; LAT also prints messages for errors detected by ISBONL. The LAT error messages are listed below. Chapter 10 explains ISBONL error messages.

LAT...UNIT MUST BE AN SB DEVICE

DECdataway unit number contained the digit 8 or 9.

LAT...ILLEGAL UNIT NUMBER

DECdataway address exceeds the highest address for the number of ports configured in the host build procedure.

LAT...UNIT NOT A TERMINAL INTERFACE UNIT IS NOT A DYT01 OR DPM01

The device at DECdataway address SBxx: is not a DPM01, VT110, or DYT01. Attributes cannot be loaded.

LAT...UNIT OFFLINE

The DPM01, VT110, or DYT01 at SBxx: is not connected and powered on.

LAT...ERROR IN ISBONL - ATTRIBUTES NOT LOADED SUCCESSFULLY

ISBONL was spawned but did not run successfully; an ISBONL message is also printed.

LAT...ISBONL CURRENTLY ACTIVE

ISBONL was already running when LAT attempted to spawn it; try again.

LAT...SPAWN DIRECTIVE ERROR

SPWN$ directive failed. Try again.

LAT...COMPLETED

9.3 DISPATCHER UTILITIES

9.3.1 FDD

Connecting a terminal to the FDD Dispatcher means that the dispatcher will begin monitoring that terminal for specific keys or indexes. The dispatcher starts a predefined task if the appropriate key or index is entered from a connected terminal. As described in Chapter 6, you create a file which describes the mapping of keys (or indexes) to tasks for each terminal to be monitored by the FDM dispatcher. See the *DPM/DPM-PLUS Terminal User's Guide* for a description of the FDM Dispatcher.

The FDD utility:

- Connects a terminal to the FDM Dispatcher.
- Disconnects a terminal from the FDM Dispatcher
- Connects all terminals defined in the Dispatch file

Run FDD by entering one of the following three commands:

```
>FDD START SBxx:

>FDD STOP SBxx:

>FDD BEGIN
```

where:

START SBxx:	connects the terminal whose DECdataway address is SBxx:
STOP SBxx:	disconnects the terminal whose DECdataway address is SBxx:
BEGIN	connects all terminals defined in the FDM Dispatch file

9.3.2 CDU

CDU is a DPM-PLUS utility, which

- Connects a terminal to the ATS Dispatcher
- Disconnects a terminal from the ATS Dispatcher
- Displays the status of a terminal with respect to the ATS Dispatcher.

You may connect conventional mounted DPM01, VT110, or DYT01 terminals or local DPM-PLUS host terminals to the ATS Dispatcher. When a terminal is connected, an operator can request the ATS Dispatcher to run a task.

9.3.2.1 How to Invoke CDU—You must install the task CDU. Invoke CDU by typing the task name in response to an MCR prompt. You generally include a command to CDU on the same line, in the form:

```
CDU dev:/sw
```

where:

dev:	is the terminal's device and unit number, expressed as:
	SBn: for a DPM01, VT110, or DYT01 terminal TTn: for a local terminal or a logical device name previously assigned to one of the above device types
/sw	is one of the following switches:
	/CO to connect the terminal /DI to disconnect the terminal /ST to display the terminal's status

After a successful connect, CDU prints one of the following messages.

CDU - dev: CONNECTED

The terminal is connected.

CDU - dev: CONNECTED, TASK ACTIVE "taskname"

The terminal was already connected. The task named task name, previously dispatched, is currently running.

After a successful disconnect, CDU prints one of the following messages.

CDU - dev: MARKED FOR DISCONNECT

The terminal is being disconnected.

CDU - dev: MARKED FOR DISCONNECT, TASK ACTIVE "taskname"

The task named taskname was spawned on behalf of the terminal and is still running. When the task exits, the terminal will be disconnected.

CDU - dev: NOT CONNECTED

The terminal was already disconnected, or was never connected.

After a successful request for status, CDU prints one of the above messages.

If you type only CDU at the MCR prompt, CDU prompts for its first command:

```
CDU>
```

CDU then prompts after each command. To exit CDU, enter CTRL-Z.

NOTE

CDU accepts as input the name of an indirect command file (preceded by @). The file must contain one CDU command per line. This allows you to run CDU in the DPM-PLUS system startup file, and cause CDU to invoke a separate indirect command file. You can maintain the separate file to control terminal access to the ATS Dispatcher, without disturbing the startup file.

Example:

```
>CDU SB16:/CO
CDU - SB16: CONNECTED
```

9.3.2.2 CDU Error Messages

CDU - CONNECT FAILED, MAXIMUM NUMBER OF TERMINALS CONNECTED

During the host build procedure, one of the questions asks for the maximum number of terminals that may be connected to the ATS Dispatcher simultaneously. That number were already connected when a CDU command attempted to connect another terminal.

CDU - CONNECT FAILED, BECAUSE OF ASSIGNMENT FAILURE

The Dispatcher task failed the "ALUN" Directive. Check the CO: device for further error messages.

CDU - ILLEGAL FUNCTION CODE OF X, RECEIVED FROM DSP TASK

Abort the Dispatcher and run it again. If the error recurs, contact DIGITAL.

CDU - RECEIVE BUFFER SEQUENCE ERROR

Abort the Dispatcher and run it again. If the error recurs, contact DIGITAL.

CDU - SYNTAX ERROR

The command line did not conform to syntax rules.

CDU - EXTRA PACKET RECEIVED

Abort the Dispatcher and run it again. If the error recurs, contact DIGITAL.

CDU - INVALID DEVICE

The device specified is not type SB: or TT:, or the terminal is not available, or the terminal ACP is not running.

CDU - DVN: DEVICE NOT IN SYSTEM

Device name reassignment did not result in a legal SB: or TT: device.

CDU - DIRECTIVE FAILURE DURING SDAT, DSW CODE = XXX

XXX may be:
  USTP
  RCST
  GCML
  SRDA
  RUN

Directive error encountered, see RSX-11M/M-PLUS Executive Reference Manual.

CDU - DVN: NOT CONNECTED, UNIT CURRENTLY ATTACHED TO ANOTHER TASK

A task is currently using the terminal you attempted to connect to DSP.

CHAPTER 10
DPM/DPM-PLUS ERROR REPORTING

10.1 DECdataway EVENT AND ERROR LOGGING

The DECdataway controller and its driver (SBDRV) detect events and errors. Events include device on-line/off-line transitions and DECdataway controller initializations. Errors include line errors, terminal faults, DECdataway faults, data errors, device/controller time-outs, and addressing errors.

The task ISBERR logs DECdataway events and errors. ISBERR must be installed under its own name before the driver is loaded. Whenever a loggable event occurs, SBDRV invokes ISBERR usually within five seconds. SBDRV increments an error sequence number and attempts to obtain enough space from the dynamic storage region (DSR) to contain the event record. The error sequence number, the controller number, unit number, time and date, and event specific information are recorded. If DSR space is unavailable, the event will not be recorded but will be indicated by a gap in the error sequence numbers. DSR space may be unavailable for either of two reasons: all available system DSR space is in use, or the maximum DSR allocation for DECdataway error logging would be exceeded by this event. ISBERR copies event records into the file LB:[1,6]ISBERR.LOG. You can run task ISBRPT to produce a report of logged errors from this file. Section 10.1.2 explains how to run ISBRPT.

Errors for some operations cause the DECdataway controller or SBDRV to retry the operation. The DECdataway controller detects line errors on the DECdataway and automatically retries detected erroneous transmissions up to four times. The number of retries and a description of the line error type will appear in the chronological error report.

The driver (SBDRV), upon detection of a LATENCY WITH DATA error, will automatically retry the operation up to eight times before terminating it unsuccessfully.

The errors LOST PW INTERRUPT and NXM-ISB11 FATAL indicate serious controller problems or possibly user program writing into the controller's registers in the I/O page. Upon detection of either of these errors, the driver will invoke ISBINI to reinitialize the controller. Prior to invoking ISBINI, the driver will terminate all I/O operations to devices on that DECdataway. The driver will try up to eight times to get the controller restarted. If it is unsuccessful, the error RELOAD MAX EXCEEDED will be logged. There must be enough memory available at all times for ISBINI, ISBERR, and (if there are DPM01s, VT110s, or DYT01s in the system) ISBONL to be run.

10.1.1 DECdataway Error Log Report Format

The fields composing a line in the error log report are as follows:

ERR nnnnn	Error sequence number
AT hh:mm:ss.t	Time stamp includes seconds and tenths of seconds
ON dd-mmm-yy	Date stamp

ISB#n	Controller Number n = 0–3
UNIT n	Unit number = 0-778 for this controller
state	Unit state: ACT=I/O in progress IDL=No I/O in progress
status	Command status: INP=driver has passed the command to the controller. PWQ=Driver has begun processing the request but has not yet passed it to the controller.
message	See Table 10-1.

Table 10-1 Error Log Messages

Error Name	Description
LATENCY NO DATA	The DECdataway controller was unable to transmit to the specified unit. Possible causes include noise on the DECdataway or some device transmitting when it should not be. Any outstanding operation on the device is terminated.
LATENCY WITH DATA	May be caused by problems on DECdataway as in LATENCY NO DATA or by Unibus latency errors. SBDRV will retry the operation up to eight times.
NXM-USER AREA	The DECdataway controller encountered a memory time-out (nonexistent memory) while trying to access the user buffer area for the specified device. The operation is terminated.
ON-LINE TRANSITION	Device on-line transition is detected by the DECdataway controller. Under DPM-PLUS, the controller detected that the device was available.
OFF-LINE-DEVICE	Device off-line transition is detected by the DECdataway controller. Any outstanding operation on the device is terminated. Under DPM-PLUS, the controller detected that the device was not available.
BUFFER OVERRUN	A device transmitted too much data to fit in the user program's buffer. Typically caused by an error in the user program; e.g., attempting to read an 80 column card into a 40 byte buffer.
OFF-LINE-CANCEL	Device off-line transition detected by the driver. Under DPM-PLUS, the driver detected that the device was not available.

Table 10-1 Cont.

WRITE TIMEOUT	A write command to the specified device did not complete within 10 seconds. Detected by the driver. Caused by attempting to send data to a device that is not ready to receive data.
UNSOLICITED DATA	The driver received an uninterpretable message from the DECdataway controller. Probably caused by a bad controller, but possibly caused by a corrupted driver.
0 BYTES XFR'D	User program performed a read operation on a broadcast channel, which is a software error.
INVALID TYPE 2	See UNSOLICITED DATA.
IODN-NO XFR	The DECdataway controller reported a completion, while the driver had no operation outstanding. May occur when a device goes off-line, and when device makes an off-line/on-line transition.
INVALID UNIT	Inconsistency between DECdataway controller and DECdataway driver. Detected by SBDRV. Possibly caused by rebuilding the driver without reloading the data base. Driver takes no action.
LINE ERROR	The controller error recovery procedure was invoked during an exchange with the specified device. The procedure was successful unless there is an accompanying OFFLINE - DEVICE entry in the log. Caused by noise on the DECdataway or by a failing device. Line errors, by themselves, are transparent to the user program. A second message line further describes each line error, as follows: CRC = truth TMO = truth PRO = truth PID = n REPEAT = m In the first three fields, a truth value (T or F) indicates whether the error was: • Bad data caused by noise on the line and detected by cyclic redundancy check at the host (CRC) • Timeout—The device did not respond when polled by host (TMO) • Incorrect DECdataway protocol in message (PRO)

Table 10-1 Cont.

	If PRO = T, PID is a nonzero protocol error number; if PRO = F, PID = 0.
	The REPEAT field indicates the number of unsuccessful transmissions by the host during one poll.
	ON LINE - I/O DONE Device on-line transition. Detected by SBDRV. Under DPM-PLUS, the driver detected that the device was not available.
	NXM - ISB11 FATAL The controller encountered a memory time-out while attempting to access memory within the driver. May be caused by a faulty controller or by bad host memory. All transfers on this controller are terminated. The driver attempts to recover by invoking the task ISBINI to reload the controller microcode.
	LOST PW INTERRUPT Driver-detected controller failure (interrupt time-out). Same driver action as to NXM - ISB11 FATAL.
	ISBINI REQUESTED Informational message. Driver made run request for initiator task.
	RELOAD MAX EXCEEDED The driver has attempted to reload the controller microcode eight times. Probably the specified controller is inoperative.

You may also request a summary report, which prints a cumulative count for each type of DECdataway error.

10.1.2 Example of ISBRPT

```
ERR 00001 AT 15:40:58.6 ON 01-MAY-80 ISB#0, UNIT 00 IDL     ISBINI REQUESTED
ERR 00002 AT 15:40:58.6 ON 01-MAY-80 ISB#1, UNIT 00 IDL     ISBINI REQUESTED
ERR 00003 AT 15:40:58.6 ON 01-MAY-80 ISB#2, UNIT 00 IDL     ISBINI REQUESTED
ERR 00004 AT 15:40:58.6 ON 01-MAY-80 ISB#3, UNIT 00 IDL     ISBINI REQUESTED
ERR 00005 AT 15:41:05.2 ON 01-MAY-80 ISB#0, UNIT 01 IDL     ONLINE TRANSITION
ERR 00006 AT 15:41:05.2 ON 01-MAY-80 ISB#0, UNIT 02 IDL     ONLINE TRANSITION
ERR 00007 AT 15:41:05.2 ON 01-MAY-80 ISB#0, UNIT 03 IDL     ONLINE TRANSITION
ERR 00008 AT 15:41:05.2 ON 01-MAY-80 ISB#0, UNIT 04 IDL     ONLINE TRANSITION
ERR 00009 AT 15:41:05.2 ON 01-MAY-80 ISB#0, UNIT 07 IDL     ONLINE TRANSITION
ERR 00010 AT 15:41:10.8 ON 01-MAY-80 ISB#1, UNIT 01 IDL     ONLINE TRANSITION
ERR 00011 AT 15:41:10.8 ON 01-MAY-80 ISB#1, UNIT 02 IDL     ONLINE TRANSITION
ERR 00012 AT 15:41:10.8 ON 01-MAY-80 ISB#1, UNIT 03 IDL     ONLINE TRANSITION
ERR 00013 AT 15:41:10.8 ON 01-MAY-80 ISB#1, UNIT 04 IDL     ONLINE TRANSITION
ERR 00014 AT 15:41:10.9 ON 01-MAY-80 ISB#1, UNIT 16 IDL     ONLINE TRANSITION
ERR 00015 AT 15:41:10.9 ON 01-MAY-80 ISB#1, UNIT 17 IDL     ONLINE TRANSITION
ERR 00016 AT 15:41:20.2 ON 01-MAY-80 ISB#1, UNIT 02 IDL     OFFLINE - DEVICE
ERR 00017 AT 15:41:20.2 ON 01-MAY-80 ISB#1, UNIT 02 IDL     ONLINE TRANSITION
ERR 00018 AT 15:41:20.9 ON 01-MAY-80 ISB#1, UNIT 03 IDL     OFFLINE - DEVICE
ERR 00019 AT 15:41:20.9 ON 01-MAY-80 ISB#1, UNIT 04 IDL     OFFLINE - DEVICE
ERR 00020 AT 15:41:20.9 ON 01-MAY-80 ISB#1, UNIT 03 IDL     ONLINE TRANSITION
ERR 00021 AT 15:41:20.9 ON 01-MAY-80 ISB#1, UNIT 04 IDL     ONLINE TRANSITION
ERR 00022 AT 16:29:18.7 ON 01-MAY-80 ISB#1, UNIT 03 IDL     OFFLINE - DEVICE
ERR 00023 AT 16:29:18.7 ON 01-MAY-80 ISB#1, UNIT 03 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00024 AT 16:29:18.7 ON 01-MAY-80 ISB#1, UNIT 04 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 2
ERR 00025 AT 16:29:18.8 ON 01-MAY-80 ISB#1, UNIT 16 IDL     OFFLINE - DEVICE
ERR 00026 AT 16:29:18.8 ON 01-MAY-80 ISB#1, UNIT 16 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00027 AT 16:29:18.8 ON 01-MAY-80 ISB#1, UNIT 17 IDL     OFFLINE - DEVICE
ERR 00028 AT 16:29:18.8 ON 01-MAY-80 ISB#1, UNIT 17 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00029 AT 16:29:18.8 ON 01-MAY-80 ISB#1, UNIT 04 IDL     OFFLINE - DEVICE
ERR 00030 AT 16:29:18.8 ON 01-MAY-80 ISB#1, UNIT 04 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00031 AT 16:29:32.1 ON 01-MAY-80 ISB#1, UNIT 01 IDL     OFFLINE - DEVICE
ERR 00032 AT 16:29:32.1 ON 01-MAY-80 ISB#1, UNIT 01 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00033 AT 16:29:32.1 ON 01-MAY-80 ISB#1, UNIT 02 IDL     OFFLINE - DEVICE
ERR 00034 AT 16:29:32.1 ON 01-MAY-80 ISB#1, UNIT 02 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00035 AT 16:29:35.3 ON 01-MAY-80 ISB#3, UNIT 01 IDL     ONLINE TRANSITION
ERR 00036 AT 16:29:35.3 ON 01-MAY-80 ISB#3, UNIT 02 IDL     ONLINE TRANSITION
ERR 00037 AT 16:31:22.3 ON 01-MAY-80 ISB#3, UNIT 01 IDL     OFFLINE - DEVICE
ERR 00038 AT 16:31:22.3 ON 01-MAY-80 ISB#3, UNIT 01 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00039 AT 16:31:22.3 ON 01-MAY-80 ISB#3, UNIT 02 IDL     OFFLINE - DEVICE
ERR 00040 AT 16:31:22.3 ON 01-MAY-80 ISB#3, UNIT 02 IDL     LINE ERROR
 CRC = F TMO = T PRO = F PID = 0 REPEAT = 4
ERR 00041 AT 16:33:21.5 ON 01-MAY-80 ISB#3, UNIT 01 IDL     ONLINE TRANSITION
ERR 00042 AT 16:33:21.5 ON 01-MAY-80 ISB#3, UNIT 02 IDL     ONLINE TRANSITION
ERR 00043 AT 16:37:14.2 ON 01-MAY-80 ISB#3, UNIT 16 IDL     ONLINE TRANSITION
ERR 00044 AT 16:37:14.2 ON 01-MAY-80 ISB#3, UNIT 17 IDL     ONLINE TRANSITION
ERR 00045 AT 17:13:55.5 ON 01-MAY-80 ISB#3, UNIT 01 ACT INP OFFLINE - DEVICE
ERR 00046 AT 17:13:55.6 ON 01-MAY-80 ISB#3, UNIT 01 IDL     ONLINE TRANSITION
ERR 00047 AT 17:24:14.1 ON 01-MAY-80 ISB#3, UNIT 01 ACT INP BUFFER OVERRUN
```

10.1.3 How to Run ISBRPT

Install ISBRPT.

Type RUN ISBRPT

The program responds with:

ISBRPT - DECDATAWAY ERROR REPORT TASK

PRINT SUMMARY [Y OR N]?

A response of "Y" will select the production of a report which lists the number of errors which occurred in each error class for each DECdataway unit in the system. The program continues with:

PRINT ENTIRE FILE [Y OR N]?

A response of "Y" will select the production of a report which lists each error chronologically.

If either or both reports have been selected, the program will query:

OUTPUT TO LINE PRINTER [Y OR N]?

The response "Y" will cause the report(s) to be produced on the device LP0:. The response "N" will cause the report to be produced at the user's terminal (device TI:). If either report has been selected, the program will ask:

WANT ONE CONTROLLER [Y OR N]?

A response of "N" will select reporting of all errors for all units in the system. A response of "Y" will cause the program to request the controller number with the prompt:

SPECIFY CONTROLLER NUMBER:

On entry of the DECdataway controller number (0–3) whose errors are to be reported, the query:

WANT ALL DEVICES [Y OR N]?

is printed. The response "Y" will cause the report to include all the errors for all units on the selected DECdataway. The reponse "N" will cause the program to prompt:

SPECIFY DEVICE NUMBER:

The report will contain the errors for only the selected unit number on the selected controller. The program will then ask:

DELETE ERROR FILE [Y OR N]?

The "Y" response will cause the error log file to be deleted after the requested reports have been generated. This option requires that ISBRPT and ISBERR be installed under their own names and that the user is logged in under a privileged account. ISBRPT will invoke ISBERR to rename the error log file to ISBERR.TMP and to create a new error log file for errors which occur during report generation. Upon completion of the report, the file ISBERR.TMP will be deleted.

INVALID CONTROLLER NUMBER

INVALID DEVICE NUMBER

Errors issued during execution:

Directive errors of the form:

DIRECTIVE FAILURE DURING <error>:ERR CODE =

where error is one of the following:

ATTACH
ASSIGN
SEND
(RUN) REQUEST
RECEIVE
QIO
OPEN (OFNB$)
CLOSE
DELETE (DLFNB)
PARSE
GET

I/O errors of the form:

I/O ERROR DURING <error>: ERR CODE =

where error is one of the following:

OPEN (OFNB$)
CLOSE
DELETE (DLFNB)
PARSE
GET

Miscellaneous errors:

ISBERR IS NOT INSTALLED
NO REPONSE FROM ISBERR
INVALID CONTROLLER NO. ENCOUNTERED
INVALID DEVICE NO. ENCOUNTERED
ERROR FILE IS EMPTY
INVALID ERROR CODE

10.2 CONSOLE ERROR MESSAGES

The following tasks type error messages at the system console:

ISBINI	DECdataway controller initialization task
ISBERR	DECdataway error logging task
ISBONL	DPM01, VT110, DYT01 attribute loading task
DLC	Network down-line load and control task
DISBOO	Network automatic reboot program for DIS
DSP	**ATS Dispatcher, under DPM-PLUS**
FDMSE	FDM Dispatcher
SBTACP	**DPM-PLUS Terminal ACP**

DLC and DISBOO messages are explained in the *DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide*. FDMDSE error messages are discussed in the *DPM/DPM-PLUS Terminal User's Guide*. Other console messages are discussed in the following sections.

10.2.1 ISBINI Error Messages

CONFIDENCE TEST FAILURE ON UNIT XX, ERR=YY

The DECdataway controller number "XX" has failed a preliminary confidence check. The controller is not initialized.

CRAM FUNCTION TEST ON UNIT XX

The DECdataway controller number "XX" has failed a preliminary test of its control RAM. The controller is not initialized.

CRAM LOAD FAILURE ON UNIT XX

ISBINI has failed to load either the confidence check or DECdataway controller microcode to controller "XX". The controller is not initialized.

ISB11 DATA STRUCTURE INCONSISTENT

Either the DECdataway data structures are corrupted or ISBINI is corrupted.

ISB11 DEVICE DRIVER NOT LOADED

The DECdataway driver must be loaded.

NO ISB11 IN SYSTEM

This system has a DECdataway controller driver which is not currently loaded.

OPEN FAILURE ON MICROCODE FILE

ISBINI is unable to access the file with the DECdataway controller microcode. Some controllers may already have been initialized. Use the MCR command "DEV SB:" to determine which controllers, if any, have been initialized.

10.2.2 ISBERR Error Messages

ERROR LOGGER IS NOT INSTALLED BY PROPER NAME

The error logger is running under a name other than ISBERR.

SERIAL BUS DRIVER IS NOT LOADED

The error logging task will not run with the DECdataway unloaded.

INVALID TASK OR DATA IN RECEIVE

The error logger will only accept data sent from ISBRPT via the SEND/RECEIVE directives. If any other task attempts to send data to ISBERR, or if the data is not valid, this error message is produced.

DEVICE FULL!! RUN ISBRPT AND DELETE THE FILE

There is no room left on the error log device for any more errors to be logged.

LOGGING DISABLED! RUN ISBERR TO RESTART IT

Some error has occurred while attempting to write an error to the logging device. This makes it impossible to continue logging.

10.2.3 ISBONL Error Messages

NO ATTRIBUTE FILE. NO DPM01'S IN THIS SYSTEM

The file LB:[1,2]DPMATT.ISB was not found. ATGEN should be run to create the file and attributes for the DPM01s, VT110s, or DYT01s in the system.

I/O TIMED OUT LOADING ATTRIBUTES TO SBNNN:

More than 5 seconds have elapsed since the attributes were sent to SBXXX: and the I/O still has not completed. The I/O request is cancelled and no further attempt will be made to load attributes to this unit.

NON-EXISTENT CONTROLLER. ?-FATAL DATA BASE ERROR

BROADCAST CHANNEL MARKED AS DPM01 - FATAL DATA BASE ERROR

These errors can be caused by corruption of the device tables or the ISBONL task image. (DPM01 here also includes DYT01 and VT110.)

NO ATTRIBUTES FOUND FOR SBNNN:

The unit has been designated as a DPM01, VT110, or DYT01 during generation of the driver but there are no attributes for it in the attributes file. Use ATGEN to correct the problem.

XXX FAILURE DURING YYY, ERR CODE = ZZZ

XXX will be either "Directive" or "I/O", YYY will be either "Opening attributes file", "Reading attributes file", or "Loading attributes to SBNNN:", and ZZZ will be the RSX-11M error code for the directive or I/O failure.

I/O ERROR DURING XXX, ERR CODE = YYY

XXX will be either "Opening attributes file", "Reading attributes file", or "Loading attributes to SBNNN:", and YYY will be the RSX-11M error code for the I/O failure.

10.2.4 DSP Error Messages

DSP error messages display two types of error codes (in decimal):

- I/O errors (ERROR CODE) are explained in the *RSX-11M/RSX-11M-PLUS I/O Operations Manual.*
- Directive Status Word errors ($DSW) are explained in the *RSX-11M/RSX-11M-PLUS Executive Reference Manual.*

DSP--dev: I/O ERROR, ERROR CODE = -XXX

The ATS Dispatcher experienced an I/O error trying to read from or write to terminal dev:.

DSP--SPWN DIRECTIVE FAILED FOR dev:, $DSW = -XXX

The ATS Dispatcher was unable to run a task in response to a request from terminal dev:. This error could occur if a second request is made for a task already running and not installed with a name of the form ...AAA.

DSP--UNABLE TO ATTACH dev:, ERROR CODE = -XXX

The ATS Dispatcher could not attach terminal dev:. This error could occur if the terminal is not available.

DSP--UNABLE TO DETACH dev:, ERROR CODE = -XXX

The ATS Dispatcher could not detach terminal dev:.

DSP--ALUN DIRECTIVE FAILED FOR dev:, $DSW = -XXX

When an operator tried to connect terminal dev: using CDU, the ATS Dispatcher was unable to assign a LUN to the terminal. This error should not happen during normal system operation.

DSP--SEND DIRECTIVE FAILED TO "CDUxx", $DSW = -XXX
DSP--SEND DIRECTIVE FAILED TO "DSPPRT", $DSW = -XXX

The ATS Dispatcher issues SEND directives to CDU and to the Dispatcher's protection task DSPPRT. One of these directives failed. This error should not happen during normal system operation.

10.2.5 SBTACP Error Messages

SBTACP ... NO ROOM IN LUT/DATA SPACE TO MOUNT SBxx:

SBTACP installed with an external header gives this error. When the DPM-P Terminal ACP (SBTACP) is started, it automatically mounts all terminals configured for DPM01, VT110, or DYT01 ports. The maximum number of terminals that may be mounted (n) was specified during host build. This error message is printed if SBTACP finds more than n DPM01, VT110, or DYT01 terminals; only the terminals with the n lowest DECdataway addresses get mounted.

SBTACP ... ! FATAL ! DIRECTIVE ERROR $DSW = XXX

SBTACP experienced a directive error. The Directive Status Word error code is explained in the RSX-11M/RSX-11M-PLUS Executive Reference Manual. Try rerunning SBTACP.

SBTACP ... ! FATAL ! SBDRV UNLOADED OR NOT BUILT FOR ACP

The DECdataway controller driver (SBDRV) either was not loaded at system start-up or was not built properly. Try loading SBDRV. If SBDRV is not built properly, perform a nonstandard (PATCH) host build to rebuild the driver.

CHAPTER 11
SHUTTING DOWN A DPM/DPM-PLUS SYSTEM

Before running the RSX-11M/M-PLUS SHUTUP utility at the DPM host, you should perform specific DPM shutdown procedures. If your system has a DIS network, you should close all channels between the host ACP and remote ACPs.

No additional shutdown procedures are required on a DPM-PLUS system. However, you may optionally dismount DPM01, VT110, or DYT01 terminals from the ACP explicitly.

11.1 REASON FOR CLOSING NETWORK CHANNELS

Closing network channels at shutdown accomplishes the following:

- Network tasks in the process of communicating receive their Disconnect AST entries. This allows the tasks to perform cleanup functions before exiting, such as printing messages and (for host tasks) storing data in files.
- SHUTUP can dismount the network ACP from NI:.

If possible, wait until there are no network connections before closing the host-remote channels. Closing a channel immediately breaks all logical connections between host and remote tasks.

11.2 CLOSING AN OFF-LINE DIS

If you issue a close command to a DIS that has gone off line, the host ACP does not allow the close operation to complete until the device comes back on line. SHUTUP cannot dismount the ACP until the close completes and the ACP detaches the device.

Even if you are not shutting down the system, you should bring the remote back on line and complete the close operation. During host generation, you specify the maximum number of DIS systems that may operate simultaneously. Any DIS with an open channel, even an off-line DIS, occupies one slot and may prevent another DIS from opening a channel simultaneously.

11.3 NETWORK SHUTDOWN PROCEDURE

In most production DPM systems, each DIS has a fixed node name assignment. If node names are fixed, you may include DLC Close commands in the system shutdown file (SHUTUP.CMD), for example:

```
DLC /CL:1/NO:GASLIN
```

If your system assigns node names to DISs dynamically, you must determine the node names of DISs with open channels, and then close each channel. The procedure is as follows:

1. Run NISTAT. Note the node name and unit number (base port DECdataway address) of every open DIS.

2. Run DLC. Issue a Close command for every open DIS. The DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide contains complete instructions for DLC.

It is also possible to write a task that closes every open DIS. Using the Get Remote Information call (function IO.GRI), the task can assume that every possible DECdataway address is a DIS base port. If a call completes successfully, it returns the name of the open node. The task can then call DLC to close the node. Programmed calls to DLC and to acquire network information are described in the *DPM/DPM-PLUS DECdataway Intelligent Subsystem User's Guide.*

11.4 DISMOUNTING TERMINALS

Under DPM-PLUS, the SHUTUP program will dismount all DPM01, VT110, or DYT01 terminals mounted to the terminal ACP. To speed up the shutdown procedure, you may include in the indirect command file, SHUTUP. CMD, a command to dismount each terminal. The form for such a command is:

```
>DMO SBxx:/DEV
```

APPENDIX A
DPM/DPM-PLUS SOFTWARE SUMMARY

A.1 HOST SOFTWARE

Name	Description
SBDRV	DECdataway Controller Driver
ISBINI	DECdataway Initializer
ISBERR	DECdataway Event Logger
ISBRPT	DECdataway Error Log Reporter
CBC	DECdataway Configuration Task
SPY	DECdataway Dynamic Status Reporter
ISB11	DECdataway Controller Microcode
SBCNCK	DECdataway Controller Confidence Check
NIDRV	Network Stub Driver
DPM50H	Network Host ACP
DLC	Network Down-Line Load and Control Task
ULD	Network Up-Line Dump File Utility
UPDUMP	Network Up-Line Dynamic Memory Dump
NISTAT	Network DIS Status Reporter
DISBOO	Network Automatic Rebooting Task
ATGEN	Attribute File Generator for DPM01, VT110, or DYT01 Ports
ISBONL	Attribute Loader for DPM01, VT110, or DYT01 Ports
FDCTIM	Time Announcer for FDM Terminals
FDMDSX FDMDSD FDMDIS FDMDSE	FDM Dispatcher Tasks

LAT	Single Port Attribute Loader
DSP	ATS Dispatcher
DSPPRT	
CDU	Terminal Connect/Disconnect Utility for ATS Dispatche
SBTACP	DPM-PLUS Terminal ACP
WSDEMO	RT803/RT805 Verification Task
FDMTST	Terminal Verification Task
DPMTST	DPM01, VT110, or DYT01 Terminal Verification Task
CNFIGH	Host Network Verification

A.2 REMOTE SOFTWARE

Name	Description
SVDRV	DECdataway Interface Driver
ISVERR	DIS Error Reporter
NIDRV	Network Stub Driver
DPM50R	Network Remote ACP
CNFIGR	Remote Network Verification Task

GLOSSARY

ACP

See Ancillary Control Process.

Address (DECdataway)

A device identifier for a unit on the DECdataway. An example is SB123:.

Ancillary Control Process (ACP)

A privileged task that performs logical I/O functions at a level between the user task and the physical device driver.

See Network ACP, Terminal ACP.

AST

Asynchronous System Trap.

ATS

DPM-PLUS Application Terminal Support. Consists of the ATS Dispatcher and the ATS Terminal ACP. Used with DPM01/VT110-connected terminals.

Attributes

Characteristics of a specific terminal or device attached to a DPM01 or VT110 on the DECdataway. These characteristics include baud rate, parity, number of bits per character, etc.

Base Port

The lowest port on a DPM01/VT110 or a DIS.

Broadcast Channel

Port 0 of each DECdataway controller is called the broadcast channel, and can be used only by the DPM system software.

Channel

A communication path between the host and a remote.

Connect Block

Eight-word array used in MACRO-11 programs to specify details about a network connection being either requested or rejected.

Connection

See Logical Connection.

Connection Status Block

A 32_{10} word integer array used in FORTRAN calls to the network software, to identify a connection.

CRC

Cyclic Redundancy Check.

DECdataway

The communication system that links the DPM host with terminals and remote computer subsystems.

The DECdataway consists of:

1. A multidrop cable
2. A DECdataway controller for the host (ISB11)
3. A DECdataway interface in each remote subsystem (ISV1)
4. A DECdataway interface incorporated into terminals (RT801, RT803, RT805) and multiplexers (DPM01/VT110)

DECdataway Controller

A controller (ISB11) which supervises protocol control procedures for polling, data transfer, and error recovery. It is bus master for 63 DECdataway addresses and a broadcast channel. It provides DMA paths for each of the DECdataway addresses.

DECdataway Controller Driver

See SBDRV.

DECdataway Remote Interface

A communications interface (ISV11) between the remote processor and the DECdataway. It provides for DMA transfers for the computer system and allows for booting and diagnostics.

DIS

A DPM50 or DPM23 DECdataway Intelligent Subsystem.

Dispatcher

A program or set of programs that start a task executing in response to a request from a terminal operator. Specific dispatchers are the ATS Dispatcher or the FDM Dispatcher.

DLC

The Down-Line Control Task (DLC) loads RSX-11S system images into the DIS memory over the DECdataway, and starts the system.

Down-Line Load

1. The process of loading the memory of a DIS with an appropriate system image from the host.
2. The process of loading the attributes of a specific terminal from the host to a terminal multiplexer.

DPM

1. Distributed Plant Management.
2. Distributed Plant Management software that runs under RSX-11M.

DPM-PLUS

Distributed Plant Management software that runs under RSX-11M-PLUS.

DPM01

A terminal multiplexer for the DECdataway that can support up to four terminals.

DPM23

DECdataway Programmable Subsystem—a DIS based on an LSI-11/23 processor.

DPM50

DECdataway I/O Subsystem—a DIS based on an LSI-11 or an LSI-11/23 and an I/O Control Module (IOCM) for process I/O modules.

DPM50H

The host version of the Network ACP.

See Ancillary Control Process, Network ACP.

DPM50R

The remote version of the Network ACP.

See Network ACP.

FDM

Factory Data Management.

Host Processor

The DECdataway controllers are located in this processor.

Intertask Communication

The exchange of information between a pair of tasks: one in the host, and the other in a DIS.

IOCM

The Input/Output Control Module is the controller for the I/O modules which comprise the process control I/O subsystem.

ISB11

1. Microcode file for the DECdataway controller.
2. See DECdataway CONTROLLER.

ISV11

See DECdataway Remote Interface.

Logical Connection

A conversation path between two tasks—one task in the DPM host, and the other task in a DIS.

Network ACP

An ancillary control process that transforms network requests from user tasks into I/O requests over the DECdataway. One network ACP (DPM50H) runs in the host and communicates with a network ACP (DPM50R) running in each DIS.

NIDRV

The Network Driver, one component of the DPM Network Software. It is supplied in both host and remote versions, along with the Network ACPs, to provide intertask communications.

Node

A DIS.

Node Name

An alphanumeric string up to six characters long. It is used to uniquely identify a DIS.

Node Number

Unit number of a DIS's base port.

Peripheral Control Bytes (PCBs)

The first four characters of every message sent to or from a DECdataway terminal (RT80x, DPM01/VT110) and the host computer. Used to exchange control and status information.

Polling

The process used by the DECdataway controller to interrogate a device for its status.

Port

1. One of the drops on a DECdataway controller (maximum of 64). Devices with multiple DECdataway addresses locally refer to them as ports 0 through n; for example DPM01 port 0-3, or DIS ports 0 and 1.
2. One of four terminal interfaces within a DPM01/VT110 multiplexer.
3. Control and status registers of the ISB11, as in Port Wait Queue.
4. The ISV11 is sometimes referred to as a DECdataway port.

Remote

A DIS.

RT801/803/805

Factory data collection terminals.

SBDRV

The RSX driver for the DECdataway controller.

SBTACP

See Terminal ACP.

SVDRV

The RSX driver for the DECdataway remote interface.

Terminal ACP

An Ancillary Control Process (SBTACP) that allows tasks using standard language interfaces to communicate with ATS terminals.

See ATS.

Transaction Index

A one- or two-digit value entered by the operator of a DPM01/VT110-connected terminal, which is used by the FDM Dispatcher in searching its data file for a task to be invoked.

Transaction Key

1. The key (push-button) on the face of an RT803 terminal, or one of the eight keys on the face of an RT805 terminal, used to select a transaction-handling task.
2. A value used by the FDM Dispatcher in searching its data file for a task to be invoked in response to operator action at an RT80x terminal.

Unit Number

A number between 0 and 377(8) used to reference one DECdataway address; for example, 47 used to reference SB47:.

VT110

A VT100 terminal that contains a DPM01 multiplexer.

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